PROCEEDINGS

OF THE

AMERICAN SOCIETY

OF

CIVIL ENGINEERS

(INSTITUTED 1852)

VOL. XXXIX.

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Vol. XXXIX. JANUARY, 1913. No. 1.

AMERICAN SOCIETY OF CIVIL ENGINEERS

INSTITUTED 1852

PROCEEDINGS

This Society is not responsible for any statement made or opinion expressed in its publications.

SOCIETY AFFAIRS

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MINUTES OF MEETINGS

OF THE SOCIETY

December 18th, 1912.—The meeting was called to order at 8.30 P. M.; Director T. Kennard Thomson in the chair; Chas. Warren Hunt, Secretary; and present, also, 83 members and 13 guests.

A paper by Spencer Miller, M. Am. Soc. C. E., entitled "Prevention of Mosquito Breeding," was presented by the author and illustrated with lantern slides. The Secretary read communications on the subject from Messrs. Harold Farnsworth Gray, and J. J. Rosenthal, and the paper was further discussed by Dr. Ralph H. Hunt and Messrs. Robert A. Rutherfurd, James Owen, Kenneth Allen, George A. Flynn, Frederic A. Snyder, George N. Cole, and the author.

A paper entitled "The Sanitation of Construction Camps," by Harold Farnsworth Gray, Jun. Am. Soc. C. E., was presented by title. A written discussion on the subject by R. C. Hardman, Assoc. M.

Am. Soc. C. E., was read by the Secretary, and the paper was discussed orally by Messrs. Frank E. Winsor, George A. Flynn, and Spencer Miller.

The Secretary announced the following deaths:

ALFRED PANCOAST BOLLER (*Vice-President*), elected Member, December 4th, 1867; died December 9th, 1912.

CHARLES ALBERT ALLEN, elected Member, June 4th, 1879; died December 9th, 1912.

THOMAS CHALKLEY JAMES BAILY, JR., elected Member, October 4th, 1905; died December 7th, 1912.

ROBERT BALLARD, elected Member, September 1st, 1880; died November 22d, 1912.

ANDREW BELL, elected Member, September 5th, 1883; died October 23d, 1912.

JAMES MOORE SHANLY, elected Member, July 6th, 1887; died November 28th, 1912.

HENRY ENGLAND GRIMM, elected Junior, October 2d, 1900; Associate Member, November 4th, 1908; died December 12th, 1912.

JAMES BRECKINRIDGE SPEED, elected Associate, May 2d, 1888; died July 7th, 1912.

Adjourned.

January 8th, 1913.—The meeting was called to order at 8.30 P. M.; President Ockerson in the chair; T. J. McMinn, Assistant Secretary, acting as Secretary; and present, also, 84 members and 12 guests.

The minutes of the meeting of November 20th and December 4th, 1912, were approved as printed in *Proceedings* for December, 1912.

A paper by H. T. Cory, M. Am. Soc. C. E., entitled "Irrigation and River Control in the Colorado River Delta," was presented by the Assistant Secretary, who also read written communications on the subject from Messrs. L. J. Le Conte and Morris Knowles.

The Assistant Secretary announced the election of the following candidates on January 7th, 1913:

AS MEMBERS

RALPH BUDD, Portland, Ore.
WILLIAM STODDERT CARUTHERS, Sacramento, Cal.
ELMER ELLSWORTH COLBY, Alva, Okla.
WILLIAM MCCLURG DONLEY, Pittsburgh, Pa.
JOHANNES MARCELIUS HAMMER, Pittsburgh, Pa.
FRANK WILLARD HANNA, Washington, D. C.
WASHINGTON J MILLER, San Francisco, Cal.
JEROME NEWMAN, San Francisco, Cal.
ROYAL ALBERT POLHAMUS, Chicago, Ill.

As Associate Members

Amon Benjamin Brown, Rupert, Idaho
Levant R Brown, Lafayette, Ind.
Charles Stephen Christian, Texarkana, Ark.
Stafford Xavier Comber, New York City
Warren Hoover Converse, Jr., Chattanooga, Tenn.
Sidney Wooddell Cooper, Roswell, N. Mex.
Thomas Meredith Davidson, Chicago, Ill.
Harry Johnson Deutschbein, Little Hocking, Ohio
Charles Slauter Doron, Brooklyn, N. Y.
Octavio Manuel Figueroa, Buenos Aires, Argentine Republic
Joseph Gallagher, Manila, Philippine Islands
John Huston Clark Gregg, New Paltz, N. Y.
Charles Marsh Husband, Bellevue, Pa.
Amund Marius Korsmo, Oakley, Idaho
William Eustace Maclean, Vancouver, B. C., Canada
Thomas Rucker McSwain, Tulare, Cal.
William Benjamin Moss, Tompkinsville, N. Y.
George Nelson, Los Angeles, Cal.
Howard Eastwood Phelps, Boulder, Colo.
Percy Allen Seibert, La Paz, Bolivia
Plumer Henry Smith, Texas City, Tex.
John Lynch Stanage, Fort Worth, Tex.
Harry Stewart Van Scoyoc, Montreal, Que., Canada
Vernon Gregg Watters, Live Oak, Fla.
Charles Asa Dilts Young, Seattle, Wash.

As Associates

Frederick Calvin Davis, San Francisco, Cal.
Ralph Leroy Parshall, Fort Collins, Colo.

As Juniors

Paul Bailey, Sacramento, Cal.
George Lindsley Burr, New York City
Cecil Ward Howard, Cincinnati, Ohio
Sydney Bishop Lamb, Laramie, Wyo.
William Bruce McMillan, San José, Cal.
Stuart Fabian Magor, Torrance, Cal.
Henry Brackette Parker, Albany, N. Y.
Edmund John Pickford, Johannesburg, South Africa
Albert Fredrick Porzelius, Little Rock, Ark.
Walter Mickle Smith, Jr., West New Brighton, N. Y.
Alfred Kenneth Starkweather, Bloomfield, N. J.
James Bertrand Wells, Palo Alto, Cal.
Frederick John Wright, Paterson, N. J.
George Leland Youmans, Winesap, Wash.

The Assistant Secretary announced the transfer of the following candidates on January 7th, 1913:

FROM ASSOCIATE MEMBER TO MEMBER

JOHN SEBASTIAN CONWAY, Washington, D. C.
JOSEPH SPENCER CRANE, Newark, N. J.
JOHN WILLIAMS DOTY, New York City
HOWELL TRACY FISHER, Montreal, Que., Canada
WILLIAM KENDRICK HATT, Lafayette, Ind.
WILLIAM AUGUST HUNICKE, Homer, La.
CLYDE WEBSTER MACCORNACK, Phœnixville, Pa.
HOLTON DUNCAN ROBINSON, New York City
CHARLES PERKINS WEBBER, Tierra Blanca, Ver., Mexico
WILLIAM HENRY YATES, Albany, N. Y.

FROM JUNIOR TO ASSOCIATE MEMBER

ROGER DERBY BLACK, Albany, N. Y.
MYRON CARLOS BURR, Fort George, B. C., Canada
WAYNE JOSEPH BURTON, Kansas City, Mo.
FOSTER BALDWIN CROCKER, Rome, N. Y.
GAGE HASELTON, Portland, Ore.
FRANCIS WILLIAM MCKINNEY, Baltimore, Md.
HUNTER IMBODEN SNYDER, Jacksonville, Fla.

FROM JUNIOR TO ASSOCIATE

EDWARD JOHN MEHREN, New York City

The Assistant Secretary announced the following deaths:

MORRIS M. DEFREES, elected Member, March 3d, 1880; died October 16th, 1912.

JULIAN THORNLEY, elected Associate Member, January 2d, 1901; Member, September 5th, 1905; died December 21st, 1912.

JOHN HAWKESWORTH, elected Junior, September 6th, 1904; Associate Member, November 4th, 1908; died December 10th, 1912.

Adjourned.

ANNOUNCEMENTS

The House of the Society is open from 9 A. M. to 10 P. M., every day, except Sundays, Fourth of July, Thanksgiving Day, and Christmas Day.

FUTURE MEETINGS

February 5th, 1913.—8.30 P. M.—This will be a regular business meeting. Two papers will be presented for discussion, as follows: "Characteristics of Cup and Screw Current Meters; Performance of These Meters in Tail-Races and Large Mountain Streams; Statistical Synthesis of Discharge Curves," by B. F. Groat, Assoc. M. Am. Soc. C. E.; and "The Infiltration of Ground-Water into Sewers," by John N. Brooks, Jun. Am. Soc. C. E.

These papers were printed in *Proceedings* for December, 1912.

February 19th, 1913.—8.30 P. M.—Two papers will be presented for discussion at this meeting, as follows: "A Suggested Improvement in Building Water-Bound Macadam Roads," by J. L. Meem, Assoc. M. Am. Soc. C. E.; and "On Long-Time Tests of Portland Cement," by I. Hiroi, M. Am. Soc. C. E.

These papers were printed in *Proceedings* for December, 1912.

March 5th, 1913.—8.30 P. M.—A regular business meeting will be held, and a paper by Caleb Mills Saville, M. Am. Soc. C. E., entitled "Hydrology of the Panama Canal," will be presented for discussion.

This paper is printed in this number of *Proceedings*.

March 19th, 1913.—8.30 P. M.—At this meeting a paper by E. J. Schneider, M. Am. Soc. C. E., entitled "Construction Problems, Dumbarton Bridge, Central California Railway," will be presented for discussion.

This paper is printed in this number of *Proceedings*.

SEARCHES IN THE LIBRARY

In January, 1902, the Secretary was authorized to make searches in the Library, upon request, and to charge therefor the actual cost to the Society for the extra work required. Since that time many searches have been made, and bibliographies and other information on special subjects furnished.

The resulting satisfaction, to the members who have made use of the resources of the Society in this manner, has been expressed frequently, and leaves little doubt that, if it were generally known to the membership that such work would be undertaken, many would avail themselves of it.

The cost is trifling compared with the value of the time of an engineer who looks up such matters himself, and the work can be

performed quite as well, and much more quickly, by persons familiar with the Library.

In asking that such work be undertaken, members should specify clearly the subject to be covered, and whether references to general books only are desired, or whether a complete bibliography, involving search through periodical literature, is desired.

In reference to this work, the Appendices* to the Annual Reports of the Board of Direction for the years ending December 31st, 1906, and December 31st, 1910, contain summaries of all searches made to date.

PAPERS AND DISCUSSIONS

Members and others who take part in the oral discussions of the papers presented are urged to revise their remarks promptly. Written communications from those who cannot attend the meetings should be sent in at the earliest possible date after the issue of a paper in *Proceedings*.

All papers accepted by the Publication Committee are classified by the Committee with respect to their availability for discussion at meetings.

Papers which, from their general nature, appear to be of a character suitable for oral discussion, will be published as heretofore in *Proceedings*, and set down for presentation to a future meeting of the Society, and, on these, oral discussions, as well as written communications, will be solicited.

All papers which do not come under this heading, that is to say, those which from their mathematical or technical nature, in the opinion of the Committee, are not adapted to oral discussion, will not be scheduled for presentation to any meeting. Such papers will be published in *Proceedings* in the same manner as those which are to be presented at meetings, but written discussions, only, will be requested for subsequent publication in *Proceedings* and with the paper in the volumes of *Transactions*.

LOCAL ASSOCIATIONS OF MEMBERS OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS

San Francisco Association

The San Francisco Association of Members of the American Society of Civil Engineers holds regular bi-monthly meetings, with banquet, and weekly informal luncheons. The former are held at 6 P. M., at the Palace Hotel on the third Friday of February, April, June, August, October, and December, the last being the Annual Meeting of the Association.

Informal luncheons are held at 12.15 P. M. every Wednesday, and the place of meeting may be ascertained by communicating with the

* *Proceedings*, Vol. XXXIII, p. 20 (January, 1907); Vol. XXXVII, p. 28 (January, 1911).

Secretary of the Association, E. T. Thurston, Jr., M. Am. Soc. C. E., 713 Mechanics' Institute, 57 Post Street.

The by-laws of the Association provide for the extension of hospitality to any member of the Society who may be temporarily in San Francisco, and any such member will be gladly welcomed as a guest.

Colorado Association

The meetings of the Colorado Association of Members of the American Society of Civil Engineers are held on the second Saturday of each month, except July and August. The hour and place of meeting are not fixed, but this information will be furnished on application to the Secretary, Gavin N. Houston, M. Am. Soc. C. E., 409 Equitable Building, Denver, Colo. The meetings are usually preceded by an informal dinner. Members of the American Society of Civil Engineers will be welcomed at these meetings.

Weekly luncheons are held on Wednesdays, and, until further notice, will take place at the Colorado Traffic Club.

Visiting members are urged to attend the meetings and luncheons.

Atlanta Association

On March 14th, 1912, the Atlanta Association of Members of the American Society of Civil Engineers was organized, with the following officers: Arthur Pew, President; William A. Hansell, Jr., Secretary; and Messrs. James N. Hazlehurst and Alexander Bonnyman, Members of the Executive Committee. The Association will hold its meetings in the house of the University Club.

PRIVILEGES OF ENGINEERING SOCIETIES EXTENDED TO MEMBERS OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS

Members of the American Society of Civil Engineers will be welcomed by the following Engineering Societies, both to the use of their Reading Rooms and at all meetings:

American Institute of Mining Engineers, 29 West Thirty-ninth Street, New York City.

American Society of Mechanical Engineers, 29 West Thirty-ninth Street, New York City.

Architekten-Verein zu Berlin, Wilhelmstrasse 92, Berlin W. 66, Germany.

Associação dos Engenheiros Civis Portuguezes, Lisbon, Portugal.

Australasian Institute of Mining Engineers, Melbourne, Victoria, Australia.

Boston Society of Civil Engineers, 715 Tremont Temple, Boston, Mass.

Brooklyn Engineers' Club, 117 Remsen Street, Brooklyn, N. Y.

Canadian Society of Civil Engineers, 413 Dorchester Street, West, Montreal, Que., Canada.

Civil Engineers' Society of St. Paul, St. Paul, Minn.

Cleveland Engineering Society, Chamber of Commerce Building, Cleveland, Ohio.

Cleveland Institute of Engineers, Middlesbrough, England.

Dansk Ingeniorforening, Amaliegade 38, Copenhagen, Denmark.

Engineers' and Architects' Club of Louisville, Ky., 303 Norton Building, Fourth and Jefferson Streets, Louisville, Ky.

Engineers' Club of Baltimore, Baltimore, Md.

Engineers' Club of Minneapolis, 17 South Sixth Street, Minneapolis, Minn.

Engineers' Club of Philadelphia, 1317 Spruce Street, Philadelphia, Pa.

Engineers' Club of St. Louis, 3817 Olive Street, St. Louis, Mo.

Engineers' Club of Toronto, 96 King Street, West, Toronto, Ont., Canada.

Engineers' Society of Northeastern Pennsylvania, 302 Board of Trade Building, Scranton, Pa.

Engineers' Society of Pennsylvania, 219 Market Street, Harrisburg, Pa.

Engineers' Society of Western Pennsylvania, 2511 Oliver Building, Pittsburgh, Pa.

Institute of Marine Engineers, 58 Romford Road, Stratford, London, E., England.

Institution of Engineers of the River Plate, Buenos Aires, Argentine Republic.

Institution of Naval Architects, 5 Adelphi Terrace, London, W. C., England.

Junior Institution of Engineers, 39 Victoria Street, Westminster, S. W., London, England.

Koninklijk Instituut van Ingenieurs, The Hague, The Netherlands.

Louisiana Engineering Society, 321 Hibernia Bank Building, New Orleans, La.

Memphis Engineering Society, Memphis, Tenn.

Midland Institute of Mining, Civil and Mechanical Engineers, Sheffield, England.

Montana Society of Engineers, Butte, Mont.

North of England Institute of Mining and Mechanical Engineers, Newcastle-upon-Tyne, England.

Oesterreichischer Ingenieur- und Architekten-Verein, Eschenbachgasse 9, Vienna, Austria.

Pacific Northwest Society of Engineers, 803 Central Building, Seattle, Wash.

Rochester Engineering Society, Rochester, N. Y.

Sachsischer Ingenieur- und Architekten-Verein, Dresden, Germany.

Sociedad Colombiana de Ingenieros, Bogota, Colombia.
Sociedad de Ingenieros del Peru, Lima, Peru.
Societe des Ingenieurs Civils de France, 19 Rue Blanche, Paris, France.
Society of Engineers, 17 Victoria Street, Westminster, S. W., London, England.
Svenska Teknologforeningen, Brunkebergstorg 18, Stockholm, Sweden.
Tekniske Forening, Vestre Boulevard 18–1, Copenhagen, Denmark.
Western Society of Engineers, 1737 Monadnock Block, Chicago, Ill.

ANNUAL REPORT OF THE BOARD OF DIRECTION FOR THE YEAR ENDING DECEMBER 31ST, 1912.

In compliance with the Constitution, the Board of Direction presents its report for the year ending December 31st, 1912.

The Society is growing very rapidly, and in this report, in addition to the usual statistics given under various headings, other facts have been briefly stated in the belief that the membership will be interested in having a more detailed knowledge of the general condition of the Society, and of the amount of work necessary at the present time to carry out its functions in a manner most useful to the membership.

MEMBERSHIP

The changes in membership are shown in the following table:

	JAN. 1ST, 1912.			JAN. 1ST, 1913.			LOSSES.				ADDITIONS.		TOTAL.		
	Resident.	Non-Resident.	Total.	Resident.	Non-Resident.	Total.	Transfer.	Resignation.	Dropped.	Death.	Transfer.	Election.	Loss.	Gain.	Increase.
Honorary Members.	.....	8	8	.....	7	7	....	..	..	1	.....	.....	1	....	§1
Corresponding " .	.....	2	2	.....	2	2	....	..	..	..	.....	.....	....	....	....
Members.....	623	2 305	2 928	633	2 432	3 065	....	9	5	51	*83	§119	65	202	137
Associate Members.	497	1 889	2 386	513	2 178	2 691	81	16	16	9	†102	‖325	122	427	305
Associates.....	80	98	178	76	103	179	2	5	2	3	‡2	11	12	13	1
Juniors.....	169	634	803	156	658	814	102	16	25	..	.....	‖154	143	154	11
Fellows.....	6	15	21	7	12	19	....	..	..	2	.....	.....	2	....	¶2
Totals.....	1 375	4 951	6 326	1 385	5 392	6 777	185	46	48	66	187	609	345	796	451

* 81 Associate Members, 1 Associate and 1 Junior.
† 1 Associate and 101 Juniors.
‡ 2 Juniors.
§ 3 Reinstatements.
‖ 1 Reinstatement.
¶ Decrease.

It will be noted that the net increase in membership for the year is 451.

With the last Annual Report of the Board a diagram showing the total membership each year on January 1st, from 1871 to 1912, was published. It may be found of interest, as showing the increase in total membership, to give the following figures for 10-year periods:

On January 1st, 1873, the total membership was 337:

For the 10 years				1873-1882	(inclusive)	the	total	net	increase	was		382
"	"	"	"	1883-1892	"	"	"	"	"	"		890
"	"	"	"	1893-1902	"	"	"	"	"	"		1 103
"	"	"	"	1903-1912	"	"	"	"	"	"		4 065

The number of applications received during 1912 was 906: 670 for admission, and 236 for transfer.

The losses by death reported during the year number 66, and are as follows:

Honorary Members (1): George Wallace Melville.

Members (51): Charles Albert Allen, Thomas Chalkley James Baily Jr., Robert Ballard, Andrew Bell, Frederick Wagoner Bennett, Alfred Pancoast Boller, Daniel Seymour Brinsmade, Carl Waldemar Buchholz, Alfred Ellsworth Carter, James Edmund Childs, William Billings Clapp, Morris M. Defrees, Samuel Clarence Ellis, James Kennon Geddes, Stephen Samuel Haight, Julien Astin Hall, Charles Lewis Harrison, Benjamin Morgan Harrod, Arthur Powis Herbert, John Herron, James Breading Hogg, Horace E. Horton, William Bell White Howe, Thomas Moore Jackson, Edward Henry Keating, George Albert Kimball, Lewis Kingman, William Frederick Lockwood, Henry Fiddeman Lofland, James Riddle Maxwell, Frank Otis Melcher, David Spencer Merritt, Charles Augustine Miner, Edward Mohun, Charles Edward Moore, Charles James Morse, John Lawrence Power O'Hanly, LaFayette Olney, Walter A. Post, Joseph Allen Powers, William Haselton Puffer, Robert Leland Read, James Dix Schuyler, James Moore Shanley, Cecil Brunswick Smith, Joseph Shuter Smith, T. Guilford Smith, Julian Thornley, William Chattin Wetherill, George Howard White, Henry Fisher White.

Associate Members (9): Rowan Ayres, Donald Dean Colvin, Henry England Grimm, Walter Scott Hanna, John Hawkesworth, Antonio Esteban Mesa, William Madison Myers, Ulrich Taubenheim, James Hugh Wise.

Associates (3): Basil Henry Leather, James Dynan Newton, James Breckinridge Speed.

Fellows (2): Bernard N. Farren, Stephen Holman.

LIBRARY

The total contents of the Library and the increase during the year, are shown in the following statement:

	Total Contents.	Increase during 1912.
Bound volumes	21 907	1 282
Unbound volumes	42 132	2 415
Specifications	7 197	180
Maps, photographs and drawings	4 598	172
Total	75 834	4 049

Of these, 1 720 were donations received in answer to special requests; 94 were donations from publishers; 1 980 were donations received in regular course, and 255 were purchased.

The value of accessions to the Library during the year is as follows, each accession having been valued separately as received:

Donations and exchanges (estimated value)..	$2 423.99
255 volumes purchased (cost).....	761.39
Binding 348 volumes.....	412.00
Total	$3 597.38

The following amounts have been expended upon the Library during the year:

Purchases, subscriptions, and binding.....	$1 173.39
Fixtures, supplies, express charges, etc.....	239.06
Total	$1 412.45

The card index now contains about 83 000 cards.

During the year 67 new bibliographies (containing 2 537 separate references) have been made, copies of 14 searches made in previous years have been furnished, 6 of these having been brought up to date. The total cost of this work, $793.93, has been charged to those for whom it was undertaken.

The total attendance in the Reading Room and Library during the year was 3 967, but this does not include those who use the Library during the semi-monthly meetings.

For a statement in detail of the general work carried out in the Library, members are referred to the report of the Board for last year.

OFFICE WORK

The following summary may serve to place before the membership some idea of the volume of work required in the office.

During the year 1912 the following material was mailed from the Society House: 17 529 Letters; 27 800 Postals; 6 718 Forms; 20 442 Volumes of *Transactions;* 68 899 Numbers of *Proceedings;* 70 785 copies of Preliminary Lists; 64 604 Circulars; 7 077 copies of List of Members; 6 314 Volumes of Index to *Transactions;* 4 522 Separate Papers (about 1 000 packages); 895 copies of Memoirs (about 100 packages); 11 032 Bills; 6 600 Receipts; 319 Ballots; 642 Badges; and 321 Certificates of Membership; a total of 310 182 pieces, or an average of 1 024 pieces for every working day. Therefore, the average number of times the Society communicates with each of its members during the year is about 50.

During 1912 the total weight of material handled in the office and forwarded by mail, express, etc., was about 81½ tons, of which *Transactions, Proceedings,* and Indexes constituted about 72 tons.

The Bookkeeping Department now handles 7 000 separate accounts, and this number increases by 500 each year.

The checking, rewriting and briefing of the 900 applications received each year, including proof reading for the Preliminary Lists of Candidates, requires great care and much time.

The volume of the publications is shown under the next heading, but reference should be made here to the large amount of editorial work, and to the proof reading, preparation of illustrations, etc.

PUBLICATIONS

During the year, ten numbers of *Proceedings,* one volume of *Transactions* for 1911, and one for 1912, one volume of Index to *Transactions* and one List of Members, have been issued.

In *Proceedings* the list of references to current engineering literature has been continued, and has covered 148 pages and contained 6 409 classified references to 108 periodicals.

The stock of the various publications of the Society, kept on hand for the convenience of members and others, now amounts to 160 055 copies, the cost of which to the Society, for paper and press work only, has been $23 316.20.

During the year, 8 377 volumes of *Transactions* and 4 275 volumes of Index to *Transactions* have been bound for members and others in standard half-morocco and cloth bindings.

SUMMARY OF PUBLICATIONS FOR 1912.

	Issues.	Average Edition.	Total Pages.	Plates.	Cuts.
Transactions (Volumes LXXIV and LXXV)	2	6 875	1 772	75	283
Proceedings (monthly numbers)	10	7 100	2 586	140	194
Constitution and List of Members	1	7 400	277	...	1
Index to *Transactions*, Volumes I to LXXIV	1	7 200	412	...	...
Totals	14	.....	5 047	215	478

The cost of publications has been:

For Paper, Printing, etc., *Transactions* and *Proceedings*	$26 947.87
For Plates and Cuts	2 544.86
For Boxes, Mailing Lists, Copyright, and Sundry Expenses	940.97
For 9 125 Extra Copies of Papers and Memoirs	1 510.34
For List of Members	1 793.15
For Index to *Transactions,* Volumes I to LXXIV	1 960.44
Total	$35 697.63
Deduct amount received from sale of publications	4 924.28
Net expenditure for publications for 1912	$30 773.35

In the last Annual Report the Board announced briefly that a new system of publication would go into effect in 1912, the chief change being the issue of one volume only of *Transactions,* instead of four. In order to accomplish this "Bible" or "India" paper was to be used. Volume LXXV, just issued, is the result, and from the many expressions of commendation received, it appears that the change has been highly satisfactory to the membership, and that the prediction that it would be a material advance has been realized. In addition to the fine appearance of the letter-press of this Volume, and its compactness (more than 1 200 pages being less than one inch in thickness), it is economical. A comparison of the cost of this Volume, including the postage, with that of the same quantity of matter if published in the old way, but omitting consideration of the half-morocco and cloth bindings undertaken for members, shows an additional cost of only $432; whereas, if that binding is included in the comparison, the total cost of the Volume is $1 020 less than if published in the old way. Moreover, in future years, when the number of pages in the annual volume is greater than in this one, perhaps twice as great, the additional cost per page will be reduced, and the advantage of this method will be shown by a still greater reduction in the total cost.

The fact should also be pointed out that the saving to the individual members of the Society who have their *Transactions* bound, has, on this volume alone, aggregated $1 519, and that this saving will be fully twice as great in the future.

In addition to the issue of the *Proceedings* and *Transactions,* an Index to Volumes I to LXXIV (covering the entire issue of this publication to date) has been compiled during the year, and issued to all members.

In a general way it may be of interest to give some figures as to the amount of printed matter issued by the Society. The issue of Monthly *Proceedings* as well as *Transactions* was begun in January, 1896, and since that time every issue of the former has been mailed to the membership on the fourth Wednesday of the month. The total number of pages published since that date has been 60 167, an average of 3 539 pages per annum.

MEETINGS

During the year 29 meetings have been held, as follows: At the Annual Meeting, 2; at the Annual Convention, 5; and 22 other meetings held at the Society House.

At these meetings there were presented 25 formal papers, 6 of which were illustrated with lantern slides. There were also 10 papers published which were not presented for discussion at any meeting of the Society. The number of members and others who took part in the preparation or discussion of these papers was 281.

The Forty-fourth Annual Convention was held at Seattle, Wash.

The total attendance at the 29 meetings held was about 4 403. The registered attendance at the Annual Meeting was 838, and at the Annual Convention 155 (includes members only), but there were many members and guests present at all of these meetings who failed to register.

At each of the ordinary semi-monthly meetings held during the year Collations have been served and these have been paid for out of Society Funds, in accordance with the action of the Annual Meeting of 1912.

In addition to the above, the Society entertained two bodies of distinguished Foreign Engineers as follows:

By special request of the General Secretary of the Twelfth International Congress of Navigation, which Congress was held in Philadelphia, Pa., the visit of the delegates to the City of New York was made under the auspices of this Society. A Reception was given at the Society House on the evening of June 3d, 1912. Excursions were made on June 4th around the Harbor (as the guests of the City of New York), and on June 5th to the Terminal Improvement of the New York Central and Hudson River R. R., and to the subway work under construction in Fourth Avenue, Brooklyn. The delegates were entertained on this day at luncheon at the Manhattan Hotel.

On the evening of September 5th, 1912, a Reception was tendered to the Foreign Delegates of the Sixth Congress of the International Association for Testing Materials, which Congress was in session in New York City during the week beginning September 2d.

MEDALS AND PRIZES

For the year ending with the month of July, 1911, prizes were awarded as follows:

The Norman Medal to George Gibbs, M. Am. Soc. C. E., for his paper entitled "The New York Tunnel Extension of the Pennsylvania Railroad: Station Construction, Road, Track, Yard Equipment, Electric Traction, and Locomotives."

The Thomas Fitch Rowland Prize to B. H. M. Hewett and W. L. Brown, Members, Am. Soc. C. E., for their paper entitled "The New York Tunnel Extension of the Pennsylvania Railroad: The North River Tunnels."

The Collingwood Prize for Juniors to A. Kempkey, Jun. Am. Soc. C. E. (now Assoc. M. Am. Soc. C. E.), for his paper entitled "A Concrete Water Tower."

During the year two additional Prizes have been established by the Board. These prizes, which may be awarded annually for papers published in the *Transactions,* are to be known as the J. James R. Croes Medal, in honor of the first recipient of the Norman Medal, and the James Laurie Prize, in honor of the first President of the Society.

FINANCES

During the year $10 000 was paid on the principal of the Mortgage on the Society Property, reducing this debt to $115 000. An addition of $20 000 was also made to the Reserve Fund established two years ago, and the Society now has a Reserve Fund of $57 000, invested in non-taxable bonds of the City of New York, which yields somewhat more than 4%, the rate paid on the Mortgage debt. The Board has ordered that $10 000 be paid on the principal of the mortgage early in 1913, and that $20 000 be added to the Reserve Fund.

The following statement indicates clearly the prosperous financial condition of the Society.

On May 25th, 1895, when the purchase of property and the building of a new Society House was under consideration, the Board of Direction issued a statement giving the available assets as follows:

"The House, 127 East Twenty-third St. (estimate).	$60 000	
Securities in Safe Deposit (par value)	16 000	
Cash awaiting permanent investment	4 500	
Total	$80 500	
Mortgage on 127 East Twenty-third St.	16 000	
Amount available		$64 500"

On the same basis a similar statement as of December 31st, 1912, would read:

The Property, 220 West 57th St. (estimate)	$600 000	
Securities in Safe Deposit (par value)	57 000	
Cash awaiting permanent investment	44 000	
Total	$701 000	
Mortgage on 220 West 57th St.	115 000	
Total available assets		$586 000

Therefore the increase in available assets in 17½ years has been $521 500, or an average of about $30 000 per year.

The statement of May 25th, 1895, continues:

"The average income from all sources for the past five years has been $33 000."

We can now say:

The average annual income from all sources for the past five years has been $125 500.

The attention of members is invited to the Secretary's statement of receipts and disbursements, and to the general balance sheet which accompanies it.

The reports of the Secretary and Treasurer are appended.

By order of the Board of Direction.

CHAS. WARREN HUNT,
Secretary.

JANUARY 7TH, 1913.

GENERAL BALANCE SHEET, DECEMBER 31ST, 1912.

ACCOMPANYING THE REPORT OF THE SECRETARY.

ASSETS.		LIABILITIES.	
Three Lots (Actual cost, $189 632.11) (Estimated value)	$375 000.00	Dues for 1913 paid in advance	$28 107.55
Society Building (cost)	170 955.59	Mortgage Debt and Loan	115 000.00
Furniture (cost)	20 110.65	Fund invested in Society House, Lots, and Library*	27 190.78
Publications on hand (inventoried cost)	23 316.20	Herbert Stewart Library Fund	1 997.50
New York City Non-Taxable Bonds (cost)	60 437.50	Gen. Joseph G. Swift Library Fund	998.75
Library: Cash expended for books, etc. $17 125.35		Surplus (including Reserve Fund of $57 441.25)	611 278.58
Donations (estimated) 62 807.99			
	79 933.34		
Due from Members	10 083.55		
Due from Non-Members	662.29		
Cash	44 074.04		
	$784 573.16		$784 573.16

We have examined the books and accounts of the American Society of Civil Engineers, for the year ended December 31, 1912, and certify that the foregoing Balance Sheet is in accordance therewith, and, in our opinion, correctly states the condition of the Society's affairs, as shown by the books.

79 WALL STREET, NEW YORK.
JANUARY 8TH, 1913.

MARWICK, MITCHELL, PEAT, & CO.,
Chartered Accountants.

* Compounding Dues Fund, $10 930.00; Norman Medal Fund, $1 000.00; Rowland Prize Fund, $1 222.50; Collingwood Prize Fund, $1 000.00; Fellowship Fund, $13 088.28

REPORT OF THE SECRETARY FOR THE

To the Board of Direction of the

Gentlemen:—I have the honor to present a statement of Receipts
31st, 1912. I also append a general balance sheet showing the condition

Receipts.

Balance on hand December 31st, 1911, in Bank, Trust Company, and in hands of Treasurer		$46 363.95
Entrance Fees	$15 290.00	
Current Dues	74 367.66	
Past Dues	2 997.04	
Advance Dues	28 107.55	
Certificates of Membership	671.15	
Badges	3 120.85	
Sales of Publications	4 924.28	
Compounding Dues	250.00	
Library	661.84	
Annual Meeting	500.10	
Binding	2 945.94	
Interest	2 737.20	
Miscellaneous	150.51	
		136 724.12
		$183 088.07

YEAR ENDING DECEMBER 31ST, 1912.

AMERICAN SOCIETY OF CIVIL ENGINEERS.

and Disbursements for the fiscal year of the Society, ending December of the affairs of the Society.

Respectfully submitted,
CHAS. WARREN HUNT,
Secretary.

DISBURSEMENTS.

Salaries of Officers	$12 800.00	
Mileage of Directors	1 331.05	
Clerical Help	20 215.39	
Caretaking	1 910.64	
Publications	35 697.63	
Postage	9 146.39	
General Printing and Stationery	3 126.88	
Library	1 173.39	
Library Maintenance	239.06	
Badges	1 883.50	
Certificates of Membership	453.00	
Binding	7 364.18	
Prizes	166.10	
Convention	516.45	
Annual Meeting	1 254.95	
Maintenance of House	109.50	
Heat, Light, and Water	1 032.69	
Furniture	330.08	
Work of Committees	316.93	
Interest	4 647.86	
Current Business	2 889.46	
Petty Expenses	216.19	
Entertainment, Navigation Congress	1 194.13	
Entertainment, 6th Congress International Assoc. for Testing Materials	729.42	
Bond and Mortgage (Payment on Principal)	10 000.00	
Reserve Fund	20 269.16	
		$139 014.03
Balance on hand December 31st, 1912:		
In Union Trust Company	$9 909.82	
In Garfield National Bank	32 664.22	
In hands of Treasurer	1 500.00	
		44 074.04
		$183 088.07

REPORT OF THE TREASURER.

In compliance with the provisions of the Constitution, I have the honor to present the following report for the year ending December 31st, 1912:

Balance on hand December 31st, 1911			$46 363.95
Receipts from current sources, January 1st to December 31st, 1912			136 724.12
Payment of Audited Vouchers for Current Business, January 1st to December 31st, 1912		$108 744.87	
Payment on principal of bond and mortgage.		10 000.00	
Purchase of bonds, Reserve Fund		20 269.16	
Balance on hand December 31st, 1912:			
In Union Trust Company	$9 909.82		
In Garfield National Bank	32 664.22		
In hands of the Treasurer	1 500.00		
		44 074.04	
		$183 088.07	$183 088.07

Respectfully submitted,

Jos. M. Knap,
Treasurer.

New York, January 7th, 1913.

ACCESSIONS TO THE LIBRARY

(From December 4th, 1912, to January 1st, 1913)

DONATIONS*

THE AMERICANS IN PANAMA.

By William R. Scott. Cloth, 8 x 5½ in., illus., 13 + 258 pp. New York, The Statler Publishing Company, 1912. $1.47.

This book, it is stated, is a non-technical review of events leading up to, and occurring during, the building of the Panama Canal, and particularly of the American engineers and laymen who have effected its construction in the broadest sense, by one who spent three months as an employee of the Isthmian Canal Commission. The scope of the book is limited to achievements on the Isthmus of Panama and only so much history of the Isthmus under the Spaniards and the French is given as will lend a perspective to the work of the Americans. The Contents are: The Land Divided—The World United; The Life Cost of the Canal; The Spanish in Panama; The Panama Railroad; The French in Panama; The Americans in Panama; The Roosevelt Impetus; Taking the Canal Zone; The Geography of Panama; Getting Under Way; The Canal Under Wallace; The Canal Under Stevens; The Canal Under Goethals; Locks and Dams; The Culebra Cut; Labor; Commissary—Quarters—Subsistence; Civil Administration; The Society of the Chagres; The Trade Outlook; Settling Our Account with Colombia; The Monroe Doctrine.

ELEMENTS OF HYDRAULICS:

A Text-Book for Secondary Technical Schools. By Mansfield Merriman, M. Am. Soc. C. E. Cloth, 7¾ x 5 in., illus., 6 + 156 pp. New York, John Wiley & Sons; London, Chapman & Hall, Limited, 1912. $1.00.

The preface states that the author has attempted in this book to present the subject of hydraulics without the use of the higher mathematics, a knowledge of arithmetic, algebra, trigonometry, and elementary mechanics only being required on the part of the reader. The book, as stated, is intended particularly for the use of students in the upper classes of secondary technical schools, and while the essential principles and methods of hydraulics have been covered, certain topics have necessarily been inadequately treated or omitted altogether, the author's intention being to discuss only those topics which are of greatest importance in practical engineering. The Chapter headings are: Hydrostatics; Theoretic Hydraulics; Flow from Orifices and Tubes; Flow Through Pipes; Flow in Conduits and Rivers; Measurement of Water; Hydraulic Motors; Pumps and Pumping; Index.

ENGINEERING OF SHOPS AND FACTORIES.

By Henry Grattan Tyrrell. Cloth, 9½ x 6¼ in., illus., 17 + 399 pp. New York, McGraw-Hill Book Company, 1912. $4.00.

This book is a sequel of, and supplementary to, the author's "Mill Buildings." It is based, it is stated, on his personal observations, study, and experience in the arrangement, construction, and operation of shops and factories extending over a period of more than twenty years, and is intended as an aid to engineers, architects, draftsmen and students, as well as factory owners and employees. In the first chapter the author gives the standard rules of conduct and business which have been established and accepted by several of the leading engineering societies. This is followed by chapters on the economics of factory location and construction, and there are included several chapters on concrete buildings and their cost, together with descriptions of easy and effective methods for their surface treatment. The subjects, foundations, walls, roofing, etc., which are treated fully in the author's previous book, are only briefly mentioned here. Several of the chapters are said to have appeared previously in *The Engineering Magazine*, and the chapters on Heating and Air Washing were contributed by the Buffalo Forge Company and that on Artificial Lighting by the Westinghouse Electric Company. At the end of the book, the author has included an extensive bibliography of the subject. The Contents are: Engineers and Their Services; Manufacturing District; Economics of Factory Construction; Example of Preliminary Design; Gen-

* Unless otherwise specified, books in this list have been donated by the publishers.

eral Design; Selection of Building Type; Wood and Steel Framing; Concrete Buildings; Concrete Surface Finish; Cost of Reinforced Concrete Buildings; Comparative Cost of Wood, Reinforced Concrete, and Steel Buildings; Foundations; Ground Floors; Upper Floors; Concrete Upper Floors; Walls, Partitions and Openings; Roofs and Roofing; Special Buildings—Notes on; Storage Pockets and Hoisting Towers; Factory Heating; Air Washing Systems; Drainage of Industrial Works; Water Supply and Storage Tanks; Steel Chimneys; Fire Protection; Cranes; Yards and Transportation; Estimates; Construction; Welfare Features; Standard Buildings, Bibliography; Index.

MODERN ORGANIZATION:

An Exposition of the Unit System. By Charles DeLano Hine. (Works Management Library.) Cloth, 7½ x 5 in., 110 pp. New York, The Engineering Magazine Co., 1912. $2.00.

The subject-matter contained in this volume appeared originally as a series of articles in *The Engineering Magazine* from January to July, 1912. It is here presented, it is stated, as a comprehensive definition of the author's unit system of management, a complete unfolding of his doctrine and practice (which, it is said, is largely mental suggestion), as applied by him on the Harriman Lines, the most extensive railway system in the world. The Contents are: The Unit System on the Harriman Lines; Operation of the Unit System; Broadening the Ideals of Line Supervision; Over-Specialization; Fallacies of Accounting; Supplies and Purchases; Line and Staff; Genesis and Revelation of Organization.

FOURTH NATIONAL CONFERENCE ON CITY PLANNING:

Proceedings, Boston, Massachusetts, May 27-29, 1912. Cloth, 9½ x 6¼ in., 10 + 232 pp. Boston, 1912. $2.00. (Donated by the National Conference on City Planning.)

This Conference, like those of 1909, 1910, and 1911, was held, it is stated, for the personal exchange of information and ideas on the subject of city planning by architects, engineers, business men, and others interested in such work, in order that the principles and details of such planning may become better known and the work better done. This volume contains the chief papers read at the Conference, together with summaries of the discussions on those papers. A partial list of the Contents is: The Progress in City Planning, by Frederick L. Olmsted; The Meaning of City Planning, by Arnold W. Brunner; The Attitude of the Engineer Toward City Planning, by George F. Swain; Paying the Bills for City Planning, by Nelson P. Lewis; Paying the Bills for City Planning from a Boston Viewpoint, by James A. Gallivan; Round Table Talks; The Problem of the Blighted District, by J. Randolph Coolidge, Jr.; The Public Street Systems of the Cities and Towns About Boston in Relation to Private Street Schemes, by Arthur A. Schurtleff; Street Planning in Newton, by Edwin H. Rogers; Street Planning in Watertown, by Wilbur F. Learned; The Legislation Necessary for Intelligent City Planning; The Regulation of the Height of Fireproof Commercial Buildings, by Arthur C. Comey; How a Worcester, Mass., Bank Discourages the "Three-Decker" House, by Alfred L. Aiken; Practical *versus* Ideal City Planning, by Amos L. Schaeffer; Popularizing the City Planning Principle; The Control of Municipal Development by the "Zone System" and Its Application in the United States, by B. Antrim Haldeman; etc., etc.

THE CURTISS AVIATION BOOK.

By Glenn H. Curtiss and Augustus Post. Cloth, 7½ x 5 in., illus., 10 + 307 pp. New York, Frederick A. Stokes Company, 1912. $1.35.

The subject-matter of this book is divided into six parts. Part I, Boyhood and Early Experiments, by Augustus Post, is devoted to the story of Mr. Curtiss' early life and his experiments with motors, motor-cycles, and balloons. In Parts II and III, Mr. Curtiss describes his first and his chief flights, together with his work and experiments on aeroplanes and hydroaeroplanes. In Part IV, The Real Future of the Aeroplane, Mr. Curtiss discusses its future uses and the problems of aviation; Capt. Paul W. Beck, U. S. A., has a chapter on the aeroplane as applied to the army, the naval side being discussed in another chapter by Lieut. Theodore G. Ellyson, U. S. N., and aviation as a future sport is described by Mr. Post. Part V, Every-Day Flying for Professional and Amateur, with chapters by Messrs. Curtiss, Post, and Hugh Robinson, is devoted to the teaching of aviation and to the operating of the aeroplane and hydroplane. In Part VI, Mr. Post discusses the Curtiss pupils and gives a description of the Curtiss aeroplane and motor.

THE METALLOGRAPHY OF IRON AND STEEL.

By Albert Sauveur. Cloth, 10¾ x 7½ in., illus., various paging. Cambridge, Mass., Sauveur and Boylston, 1912.

The preface states that, in this book, the author has endeavored to present, in a scientific and practical manner, a well-balanced, specific and comprehensive treatise on the subject of the metallography of iron and steel, which is intended for the student, the teacher, the manufacturer and user of iron and steel, the general reader, and the expert. He describes at length, it is said, the structure of metals, the processes, manipulations, and apparatus used successfully in his own laboratory and in those of other workers. At the end of each chapter examination questions on the subject discussed in that chapter are given, and the book is fully illustrated. The Contents are: Introduction; The Industrial Importance of Metallography; Apparatus for the Metallographic Laboratory; Pure Metals; Pure Iron; Wrought Iron; Low Carbon Steel; Medium High and High Carbon Steel; Impurities in Steel; The Thermal Critical Points of Iron and Steel; Their Occurrence; Their Causes; Their Effects; Cast Steel; The Annealing of Steel; The Hardening of Steel; The Tempering of Hardened Steel; Theories of the Hardening of Steel; The Cementation and Case Hardening of Steel; Special Steels; General Considerations; Constitution, Properties, Treatment, and Uses of Most Important Types; Cast Iron; Impurities in Cast Iron; Malleable Cast Iron; Constitution of Metallic Alloys; Equilibrium Diagram of Iron-Carbon Alloys; The Phase Rule; Appendix I, Manipulations and Apparatus; Appendix II, Nomenclature of the Microscopic Constituents; Index.

SUCCESSFUL HOUSES AND HOW TO BUILD THEM.

By Charles E. White, Jr. Cloth, 7¼ x 5¼ in., illus., 6 + 520 pp. New York, The Macmillan Company, 1912. $2.00.

In this book, and without giving cost data, the author describes, for the benefit of the prospective owner and builder, the best location and arrangement for various types of houses, together with building specifications and other legal documents in connection therewith, the construction of a house in detail, and the various useful apparatus and appliances necessary to a successful house. The last chapter is devoted to modern garage design and garage apparatus. The Contents are: Why Build a Home; Choosing the Site; How to Know the Architectural Styles; The Little Details That Attract; Owner, Architect, and Contractor; Planning the Rooms; Specifications Explained; A Chapter on Legal Documents; Excavation and Foundation; Advantages of a Frame House; Exterior Finish; Houses of Masonry; How to Build a Fireproof House; Carpentry and Cabinet Work; The Importance of a Good Roof; Plumbing That Is Sanitary; Water and Sewer Pipes; Latest Types of Plumbing Fixtures; Little Details of Good Plumbing; Sewage Disposal in the Country; Efficient Heating Methods; Plastering; Inside and Outside; Finishing Touches; Painting and Glazing; Useful Apparatus and Appliances; Gas and Electric Lighting; Practical Hardware for the House; Handy House Devices; Remodeling; Making an Old House New; Sensible Types of American Houses; Garages and Garage Apparatus; Index.

FIRE PREVENTION.

By Edward F. Croker. Cloth, 8 x 5¼ in., illus., 10 + 354 pp. New York, Dodd, Mead & Company, 1912. $1.50.

The fighting of many fires and the study of the subjects of fire prevention and fire extinguishment during the author's years of connection with the Fire Department of New York City, has led, it is stated, to the recommendations and plans presented by him in this book, in which he discusses the keeping down of fire waste from many angles, and describes, it is stated, those things which are vitally necessary to the reduction of fire loss, such as, fireproof construction, automatic fire alarms and devices for extinguishing fires, fire drills, fire departments, etc. The Chapter headings are: Prevention of Fire in the Dwelling and Small Town; Further Measures for Protection in the House—The Department of a Small Town; The Protection of Factories, Loft Buildings, and other Large Structures; Protection of Life in Large Buildings; Further Measures for Protecting Life; Sprinklers and Sprinkler Systems; Other Alarm Devices in Buildings; The Fire Department of a Large City; The Development of the New York Fire Department and Some of its Defects; The Nature and Value of High Pressure; The Modern Fireboat: Its Nature and Use; High Buildings and Steel Construction; Fire Prevention Bureaus and Fire Marshals; Incendiarism and Arson; Law Making and Fire Preventive Work Along Legal and Other Lines; Index.

MINERALOGY:

An Introduction to the Theoretical and Practical Study of Minerals. By Alexander Hamilton Phillips. Cloth, 9 x 6 in., illus., 8 + 699 pp. New York, The Macmillan Company, 1912. $3.75.

The preface states that the object of this book is to bring together, in concise form, for the use of the beginner, the facts and basic principles of the several branches of Mineralogy. The subject-matter has been divided into three parts: Part I, Crystallography, in which the 32 types have been described. Only graphical methods of solving the problems, after the measurement of a crystal, are given, it is stated, the mathematical solutions being left to the more advanced courses. In Part II, Descriptive Mineralogy, some 225 mineral species are described including their crystallization, optical properties, decomposition, products, genesis, occurrence, uses, and synthesis. Part III, Determinative Mineralogy, contains descriptions of the instruments and reagents, and gives determinative tables and chemical tests, used for the identification of the mineral species, including, it is stated, all minerals with the exception of some very rare species found only in one locality, and in many cases even these are given.

Gifts have also been received from the following:

Adams, Mass.-Chf. Engr., Fire Dist. 33 pam.
Annan, C. L. 4 pam.
Arizona, Univ. of-Agri. Exper. Station. 2 pam.
Arnold, Bion J. 1 pam.
Associated Metal Lath Mfrs. 1 pam.
Boston, Mass.-City Auditor. 2 bound vol.
Boston, Mass.-City Council. 1 bound vol.
Buffalo, N. Y.-City Clerk. 1 pam.
California-R. R. Comm. 1 pam.
California-State Conservation Comm. 5 pam.
California-State Forester. 1 pam.
Canada-Dept. of Marine and Fisheries. 1 vol.
Canada-Dept. of Mines. 1 vol.
Chicago, Ill.-Bureau of Statistics. 1 bound vol.
Chicago, Ill.-Harbor and Subway Comm. 1 pam.
Chicopee, Mass.-City Clerk. 7 bound vol.
Cincinnati, Ohio-Supt. of Water-Works. 1 vol.
Colorado, Univ. of. 1 pam.
Columbia Univ. 1 vol.
Concord, N. H.-City Clerk. 19 vol., 13 pam.
Concord, N. H.-City Engr. 6 pam.
Cornell Univ. 1 pam.
Dist. of Columbia-Engr. Commr. 1 vol.
East Indian Ry. Co. 1 pam.
Eiffel, G. 1 pam.
Farnham, A. B. 9 pam.
Flynn, George A. 3 bound vol.
Germany-Kaiserliche Generaldirektion der Eisenbahnen in Elsass-Lothringen. 1 vol.
Great Indian Peninsula Ry. Co. 1 pam.
Haverhill, Mass.-City Engr. 1 pam.
Illinois-State Rivers and Lakes Comm. 8 pam.
Institution of Mech. Engrs. 1 vol.
Iowa-Auditor of State. 1 vol.
Iowa-Board of R. R. Commrs. 1 bound vol.
Kansas City, Mo.-Board of Public Welfare. 1 pam.
Kansas City, Mo.-Comptroller. 1 pam.
Lake Superior Min. Inst. 1 vol.
London, England-Town Clerk, Public Health Dept. 2 pam.
Margate, England-Town Clerk. 2 bound vol.
Massachusetts-Bureau of Statistics. 1 bound vol.
Massachusetts-Mount Everett State Reservation Comm. 1 pam.
Massachusetts-State Board of Health. 1 bound vol.
Merrill, J. Evarts. 7 pam.
Municipal Engrs. of the City of New York. 1 pam.
Min. Soc. of Nova Scotia. 1 pam.
Minneapolis, Minn.-City Clerk. 17 bound vol.
Missouri, Univ. of-School of Mines and Metallurgy. 1 pam.
Montreal, Que.-Medical Officer of Health. 1 pam.
National Civic Federation. 4 pam.
New Mexico-State Corporation Comm. 1 pam.
New York City-Board of Water Supply. 2 pam.
New York State-Clerk of Senate. 1 bound vol.
North Carolina-State Board of Health. 6 pam.
Ohio State Univ. 1 vol., 1 pam.
Oregon-R. R. Comm. 1 pam.
Pasadena, Cal.-City Auditor. 9 pam.
Peoria, Ill.-City Clerk. 13 pam.
Philadelphia, Pa.-Dept. of Public Works. 4 pam.
Philippine Islands-Bureau of Public Works. 1 pam.
Philippine Islands-Weather Bureau. 2 pam.
Portland, Me.-Commr. of Public Works. 9 pam.
Poughkeepsie, N. Y.-City Chamberlain. 9 bound vol.
Rensselaer Polytechnic Inst. 2 pam.
Richmond, Fredericksburg & Potomac R. R. Co. 1 pam.
Roche, Wm. J. and Wm. C. 1 pam.
Royal Inst. of British Archts. 1 vol.
Royal San. Inst. 1 bound vol.
Saginaw, Mich.-City Engr. 14 pam.
St. Louis, Mo.-Municipal Reference Librarian. 3 bound vol., 17 vol.
Seattle, Wash.-City Comptroller. 1 pam.
Sheffield, England-City Engr. and Surv. 3 pam.

Smithsonian Institution. 3 pam.
Soc. for the Promotion of Eng. Education. 1 bound vol.
Soc. of Constructors of Federal Bldgs. 1 pam.
Sooysmith, Charles. 23 bound vol., 10 vol., 25 pam.
South Australia-Commr. of Rys. 1 pam.
South Dakota Soc. of Engrs. and Survs. 1 pam.
Stevens, L. E. 1 pam.
Stone & Webster. 1 pam.
Tasmania-Commr. of Govt. Rys. 1 pam.
Texas, Univ. of. 1 vol.
Tibbetts, Fred H. 1 vol.
Tyrrell, H. G. 1 pam.
Union Coll. 1 vol.
U. S.-Bureau of Chemistry. 1 pam.
U. S.-Bureau of Yards and Docks. 1 pam.
U. S.-Chf. of Engrs. 13 specif.
U. S.-Forest Service. 2 pam.
U. S.-Geol. Survey. 1 vol.
U. S.-Isthmian Canal Comm. 1 bound vol., 2 vol., 1 pam.
U. S.-Office of Public Roads. 1 pam.
Western Maryland Ry. Co. 1 pam.
Whitney, F. O. 26 pam.
Wilkerson, T. J. 2 vol.
Wisconsin-Geol. and Natural History Survey. 1 bound vol.
Wyoming-State Geologist. 1 pam.

BY PURCHASE

Analysis of Paint and Varnish Products. By Clifford Dyer Holley. John Wiley & Sons, New York; Chapman & Hall, Ltd., London, 1912.

Building Stones and Clay-Products: A Handbook for Architects. By Heinrich Ries. John Wiley & Sons, New York; Chapman & Hall, Ltd., London, 1912.

Light, Photometry and Illumination: A Thoroughly Revised Edition of Electrical Illuminating Engineering. By William Edward Barrows. McGraw-Hill Book Co., New York and London, 1912.

A Text-Book of Rand Metallurgical Practice Designed as a "Working Tool" and Practical Guide for Metallurgists Upon the Witwatersrand and Other Similar Fields. By C. O. Schmitt. Vol. 2. J. B. Lippincott Co., Philadelphia; Charles Griffin & Company, Ltd., London.

Standard Methods for the Examination of Water and Sewage. American Public Health Association, Laboratory Section. Second Edition. American Public Health Association, New York, 1912.

Public Health: Papers and Reports Presented at the Thirty-sixth and Thirty-seventh Annual Meetings of the American Public Health Association, Vol. 34, August 25th–28th, 1908; Vol. 35, October 19th–22d, 1909. American Journal of Public Hygiene, Columbus, Ohio, 1909–10.

SUMMARY OF ACCESSIONS

(From December 4th, 1912, to January 1st, 1913)

Donations (including 70 duplicates)	416
By purchase	7
Total	423

MEMBERSHIP

ADDITIONS

(From December 6th, 1912, to January 2d, 1913)

MEMBERS		Date of Membership.
BOARDMAN, HOWARD EDWARD. Oficina del Subterraneo, Ferro Carril de Oeste, Estacion Once, Buenos Aires, Argentine Republic	Jun.	Oct. 7, 1902
	Assoc. M.	Jan. 4, 1905
	M.	Oct. 1, 1912
BOWMAN, DANIEL WHEELER. Chf. Engr., The Phœnix Iron Co., Phœnixville, Pa		Dec. 3, 1912
BROWN, WILLIAM NELSON. Care, Brown & Clarkson, Southern Bldg., Washington, D. C		Sept. 3, 1912
FULLER, WESTON EARLE. Cons. Civ. Engr. (Hazen & Whipple), 103 Park Ave., New York City	Assoc. M.	June 7, 1905
	M.	Dec. 3, 1912
IDE, WILLIAM STONE. Res. Engr., Lockwood, Greene & Co., Care, The Studebaker Corporation, Detroit, Mich		Dec. 3, 1912
KIMBALL, JOSEPH HARRIS. Designing Engr., Commrs. of Sewerage, 605 Equitable Bldg., Louisville, Ky		Dec. 3, 1912
PEREZ CASTRO, LORENZO. Jefe de la Zona VI, de Vias y Edificios, 1ª del General Prim 1, City of Mexico, Mexico		Dec. 3, 1912
RAFF, HENRY GOTTLIEB. Chf. Designing Engr., Concrete Steel Eng. Co., Park Row Bldg., New York City		Dec. 3, 1912
REEDY, OLIVER THOMAS. Supt., Royal Basin Min. & Milling Co., Maxville, Mont.	Assoc. M.	June 6, 1906
	M.	Dec. 3, 1912
SOUTHWORTH, EDWARD AUGUSTUS. County Engr. of Hawaii, Hilo, Hawaii	Assoc. M.	July 1, 1909
	M.	Dec. 3, 1912
WILLIAMS, FRANCIS CHARLES. City Engr., Sheridan, Wyo.		Dec. 3, 1912
WOLFE, FRANK GORDON. Chf. Engr., Scranton Coal Co., Elk Hill Coal & Iron Co., and Price-Pancoast Coal Co.; Cons. Engr., N. Y., O. & W. R. R., 513 Board of Trade Bldg., Scranton, Pa		Dec. 3, 1912
ASSOCIATE MEMBERS		
BRAINARD, NORMAND DAGGETT. Supt. in Chg., Constr., The A. Bentley & Sons Co., 355 Stanton Ave., Springfield, Ohio		Dec. 3, 1912
BROWN, DAVID HARELL. Alpine, N. J.	Jun.	Feb. 4, 1908
	Assoc. M.	Oct. 29, 1912
CALDWELL, JOHN WORDE. Rd. Overseer, Dist. of Honolulu, Honolulu, Hawaii	Jun.	Aug. 31, 1909
	Assoc. M.	Dec. 3, 1912
CANAGA, GORDON BYRON. Scio, Ohio		Oct. 1, 1912
CURLEY, JAMES FRANCIS. Contr. Engr., Pittsburgh Steel Products Co., 959 Frick Annex, Pittsburgh, Pa		Dec. 3, 1912

ASSOCIATE MEMBERS (*Continued*)

		Date of Membership.
DUNHAM, ROBERT MOORE. Supt., Gen. Const. Co., 1116 Jarvis St., Fort Worth, Tex		Dec. 3, 1912
DURBIN, WILLIAM HOWARD. Supt. of Filtration, Evansville, Ind		Dec. 3, 1912
FOOTE, FRANCIS SEELEY, JR. Associate Prof. of R. R. Eng., Univ. of California, Berkeley, Cal		Dec. 3, 1912
FORTER, SAMUEL ALEXANDER. Const. Engr., James A. Green & Co., Inc., American Falls, Idaho		Oct. 1, 1912
FOSS, JAMES CALVIN, JR. Chf. Engr., Kahului R. R., Kahului, Maui, Hawaii	Jun. Assoc. M.	April 6, 1909 Oct. 1, 1912
GORHAM, FRED ALLEN. Asst. Engr., U. S. Reclamation Service, Pompeys Pillar, Mont		Dec. 3, 1912
HALL, HARRY RUTLEDGE. Asst. Engr., Bureau of San. Eng., State Dept. of Health, 6 East Franklin St., Baltimore, Md		Dec. 3, 1912
HOFF, CARL PORTER. Asst. City Engr., St. Joseph, Mo		July 9, 1912
LANGLOIS, AMEDEE. 455 Besserer St., Ottawa, Ont., Canada.		Sept. 3, 1912
OSBORN, IRWIN SELDEN. Engr. in Chg., Municipal Reduction Plant, Dept. of Public Service, 18 Seventeenth Ave., Columbus, Ohio		Dec. 3, 1912
PAGON, WILLIAM WATTERS. With J. E. Greiner, Cons. Engr., Fidelity Bldg. (Res., 1301 St. Paul St.), Baltimore, Md	Jun. Assoc. M.	Sept. 3, 1907 Dec. 3, 1912
PATTERSON, EARL. Engr., U. S. Reclamation Service, Selden, N. Mex	Jun. Assoc. M.	April 30, 1907 Dec. 3, 1912
SAYFORD, NED HENSEL. With George W. Fuller, 170 Broadway, New York City (Res., Monroe, N. Y.)		Dec. 3, 1912
SCHABERG, BENJAMIN FRANKLIN. Engr. of Constr., Sewer Dept., 3830 Ashland Ave., St. Louis, Mo		Dec. 3, 1912
SILVERTON, FRANCIS. Supt., Macdonell Gzowski & Co., P. O. Box 1723, Vancouver, B. C., Canada		July 9, 1912
STEIN, MILTON FREDERICK. Asst. Engr., Chester & Fleming, 1111 Union Bank Bldg., Pittsburgh, Pa		Dec. 3, 1912
STROUT, GALE STANLEY. 159 Lake St., Oakland, Cal	Jun. Assoc. M.	Mar. 31, 1908 Sept. 3, 1912
THORLEY, IRA OTIS. With H. S. Crocker, Cons. Engr., 308 Tramway Bldg., Denver, Colo		Oct. 29, 1912
TOLL, ASAHEL CLARK. Bayamon, Porto Rico	Jun. Assoc. M.	Mar. 5, 1907 Oct. 29, 1912
VILLA, MIGUEL. Engr. in Chg. of Havana Harbor Work for the Compania de los Puerto de Cuba, O'Reilly 41, Havana. Cuba	Jun. Assoc. M.	Oct. 6, 1908 Dec. 3, 1912
VOORHES, KIMBROUGH ENOCH. Arizona Copper Co., Morenci, Ariz		Dec. 3, 1912

ASSOCIATE MEMBERS (*Continued*)

	Date of Membership.
WESTON, THOMAS ISAAC. Pres. and Treas., Weston & Brooker Quarry Co. and Weston & Brooker, Contrs., 704 National Loan and Exchange Bank Bldg., Columbia, S. C.	Dec. 3, 1912

ASSOCIATES

PARRY, FREDERICK HUGH. Eng. Contr., 400 Wyoming Ave., Kingston, Pa.	Oct. 29, 1912

JUNIORS

BELDEN, GEORGE ALLYNE. Draftsman, Office of Chf. Engr., Cent. of Ga. Ry., Y. M. C. A. Bldg., Savannah, Ga.	Oct. 29, 1912
BUCK, WALTER VAN. City Engr., Junction City, Kans.	July 9, 1912
FISHER, GEORGE JOSEPH. Draftsman, South San Joaquin Irrig. Dist., Coyote, Cal.	Dec. 3, 1912
JAMES, JOHN RAYMOND. Junior Engr., U. S. Lake Survey, Old Custom House, Detroit, Mich.	Dec. 3, 1912
KHACHADOORIAN, HAROOTUN HOVHANNES. 34 St. Anne St., Quebec, Que., Canada	Dec. 3, 1912
PERRIN, LESTER WILLIAM. Draftsman, G. T. Ry., 114 Dowling Ave., Toronto, Ont., Canada	Dec. 3, 1912
SLEPPY, KIRBY BALDWIN. Instrumentman, Los Angeles Aqueduct Power Dept., 1134 Central Bldg., Los Angeles, Cal.	Dec. 3, 1912
THACKWELL, HENRY LAWRENCE. Chf. Engr., Lake Chelan Land Co., 722 Leary Bldg., Chelan, Wash.	Dec. 3, 1912
THOMAS, FRANKLIN. Draftsman, Alabama Power Co., Birmingham, Ala.	Dec. 3, 1912
WADE, NEWTON BENJAMIN. City Engr., Millville, N. J.	Dec. 3, 1912
YEREANCE, ALEXANDER WOODWARD. Engr. with MacArthur Bros. Co., Clanton, Ala.	Dec. 3, 1912

RESIGNATIONS

MEMBERS

	Date of Resignation.
FOLWELL, AMORY PRESCOTT	Dec. 31, 1912
GARDNER, EDMUND LEBRETON	Dec. 3, 1912
HODGES, GILBERT	Dec. 3, 1912
MCCLINTOCK, WILLIAM EDWARD	Dec. 31, 1912
ORANGE, JAMES	Dec. 3, 1912
PAYNE, WILLIAM ARTHUR	Dec. 31, 1912
RAASLOFF, HARALD DE	Dec. 31, 1912

ASSOCIATE MEMBERS

CHAMBERS, HENRY WICK	Dec. 31, 1912
DERBY, CHESTER CAWTHORNE	Dec. 31, 1912
EGAN, LOUIS HENRY	Dec. 31, 1912

ASSOCIATE MEMBERS (*Continued*)	Date of Resignation.
HOWALT, WILHELM JENS CHRISTIAN	Dec. 31, 1912
JACKSON, GRANBERY	Dec. 31, 1912
JOUETT, HENRY DETRICK	Dec. 31, 1912
LOCKE, WILLIAM WILLARD	Dec. 31, 1912
ROBBINS, HALLET RICE	Dec. 31, 1912
ROBINSON, FRANK MINER	Dec. 31, 1912
SHIRE, MOSES EDMUND	Dec. 31, 1912
STENGER, ERNEST	Dec. 31, 1912
STOUT, HOMER HARDING	Dec. 31, 1912
TOLTZ, MAX	Dec. 31, 1912
VOGT, JOHN HENRY LEON	Dec. 3, 1912
WOOD, GEORGE ROY	Dec. 31, 1912

ASSOCIATES

BOUTON, HAROLD	Dec. 3, 1912
GREEN, HOWARD BURKHARDT	Dec. 31, 1912
RAY, DAVID HEYDORN	Dec. 31, 1912

JUNIORS

CHANDLER, HORACE EDWARD	Dec. 31, 1912
CROASDALE, LAURENCE BRODHEAD	Dec. 31, 1912
CUNNINGHAM, WILLIAM AUGUSTINE	Dec. 31, 1912
LOWRY, JOHN, JR	Dec. 31, 1912
MAGLOTT, GEORGE FREDERICK	Dec. 31, 1912
NITCHIE, FRANCIS RAYMOND	Dec. 31, 1912
PAYNE, GEORGE AMOS	Dec. 31, 1912
STEWART, WALTER PHELPS	Dec. 31, 1912

DEATHS

ALLEN, CHARLES ALBERT. Elected Member, June 4th, 1879; died December 9th, 1912.

BAILY, THOMAS CHALKLEY JAMES, JR. Elected Member, October 4th, 1905; died December 7th, 1912.

BALLARD, ROBERT. Elected Member, September 1st, 1880; died November 22d, 1912.

BELL, ANDREW. Elected Member, September 5th, 1883; died October 23d, 1912.

BOLLER, ALFRED PANCOAST. (*Vice-President.*) Elected Member, December 4th, 1867; died December 9th, 1912.

DEFREES, MORRIS M. Elected Member, March 3d, 1880; died October 16th, 1912.

GRIMM, HENRY ENGLAND. Elected Junior, October 2d, 1900; Associate Member, November 4th, 1908; died December 12th, 1912.

HAWKESWORTH, JOHN. Elected Junior, September 6th, 1904; Associate Member, November 4th, 1908; died December 10th, 1912.

SHANLY, JAMES MOORE. Elected Member, July 6th, 1887; died November 28th, 1912.

SPEED, JAMES BRECKINRIDGE. Elected Associate, May 2d, 1888; died July 7th, 1912.

THORNLEY, JULIAN. Elected Associate Member, January 2d, 1901; Member, September 5th, 1905; died December 21st, 1912.

Total Membership of the Society, January 2d, 1913, 6 778.

MONTHLY LIST OF RECENT ENGINEERING ARTICLES OF INTEREST

(December 5th, 1912, to January 1st, 1913)

NOTE.—*This list is published for the purpose of placing before the members of this Society, the titles of current engineering articles, which can be referred to in any available engineering library, or can be procured by addressing the publication directly, the address and price being given wherever possible.*

LIST OF PUBLICATIONS

In the subjoined list of articles, references are given by the number prefixed to each journal in this list:

(1) *Journal*, Assoc. Eng. Soc., Boston, Mass., 30c.
(2) *Proceedings*, Engrs. Club of Phila., Philadelphia, Pa.
(3) *Journal*, Franklin Inst., Philadelphia, Pa., 50c.
(4) *Journal*, Western Soc. of Engrs., Chicago, Ill., 50c.
(5) *Transactions*, Can. Soc. C. E., Montreal, Que., Canada.
(6) *School of Mines Quarterly*, Columbia Univ., New York City, 50c.
(7) *Gesundheits Ingenieur*. München, Germany.
(8) *Stevens Institute Indicator*, Hoboken, N. J., 50c.
(9) *Engineering Magazine*, New York City, 25c.
(10) *Cassier's Magazine*, New York City, 25c.
(11) *Engineering* (London), W. H. Wiley, New York City, 25c.
(12) *The Engineer* (London), International News Co., New York City, 35c.
(13) *Engineering News*, New York City, 15c.
(14) *Engineering Record*, New York City, 10c.
(15) *Railway Age Gazette*, New York City, 15c.
(16) *Engineering and Mining Journal*, New York City, 15c.
(17) *Electric Railway Journal*, New York City, 10c.
(18) *Railway and Engineering Review*, Chicago, Ill., 15c.
(19) *Scientific American Supplement*, New York City, 10c.
(20) *Iron Age*, New York City, 20c.
(21) *Railway Engineer*, London, England, 1s. 2d.
(22) *Iron and Coal Trades Review*, London, England, 6d.
(23) *Bulletin*, American Iron and Steel Assoc., Philadelphia, Pa.
(24) *American Gas Light Journal*, New York City, 10c.
(25) *American Engineer*, New York City, 20c.
(26) *Electrical Review*, London, England, 4d.
(27) *Electrical World*, New York City, 10c.
(28) *Journal*, New England Water-Works Assoc., Boston, Mass., $1.
(29) *Journal*, Royal Society of Arts, London, England, 6d.
(30) *Annales des Travaux Publics de Belgique*, Brussels, Belgium, 4 fr.
(31) *Annales* de l'Assoc. des Ing. Sortis des Ecoles Spéciales de Gand, Brussels, Belgium, 4 fr.
(32) *Mémoires et Compte Rendu des Travaux*, Soc. Ing. Civ. de France, Paris, France.
(33) *Le Génie Civil*, Paris, France, 1 fr.
(34) *Portefeuille Economiques des Machines*, Paris, France.
(35) *Nouvelles Annales de la Construction*, Paris, France.
(36) *Cornell Civil Engineer*, Ithaca, N. Y.
(37) *Revue de Mécanique*, Paris, France.
(38) *Revue Générale des Chemins de Fer et des Tramways*, Paris, France.
(39) *Technisches Gemeindeblatt*, Berlin, Germany, 0, 70m.
(40) *Zentralblatt der Bauverwaltung*, Berlin, Germany, 60 pfg.
(41) *Elektrotechnische Zeitschrift*, Berlin, Germany.
(42) *Proceedings*, Am. Inst. Elec. Engrs., New York City, $1.
(43) *Annales des Ponts et Chaussées*, Paris, France.
(44) *Journal*, Military Service Institution, Governors Island, New York Harbor, 50c.
(45) *Mines and Minerals*, Scranton, Pa., 25c.
(46) *Scientific American*, New York City, 15c.
(47) *Mechanical Engineer*, Manchester, England, 3d.
(48) *Zeitschrift*, Verein Deutscher Ingenieure, Berlin, Germany, 1. 60m.
(49) *Zeitschrift für Bauwesen*, Berlin, Germany.
(50) *Stahl und Eisen*, Düsseldorf, Germany.
(51) *Deutsche Bauzeitung*, Berlin, Germany.
(52) *Rigasche Industrie-Zeitung*, Riga, Russia, 25 kop.
(53) *Zeitschrift*, Oesterreichischer Ingenieur und Architekten Verein, Vienna, Austria, 70h.
(54) *Transactions*, Am. Soc. C. E., New York City, $4.

(55) *Transactions*, Am. Soc. M. E., New York City, $10.
(56) *Transactions*, Am. Inst. Min. Engrs., New York City, $6.
(57) *Colliery Guardian*, London, England, 5d.
(58) *Proceedings*, Engrs.' Soc. W. Pa., 803 Fulton Bldg., Pittsburgh, Pa., 50c.
(59) *Proceedings*, American Water-Works Assoc., Troy, N. Y.
(60) *Municipal Engineering*, Indianapolis, Ind., 25c.
(61) *Proceedings*, Western Railway Club, 225 Dearborn St., Chicago, Ill., 25c.
(62) *Industrial World*, 59 Ninth St., Pittsburgh, Pa., 10c.
(63) *Minutes of Proceedings*, Inst. C. E., London, England.
(64) *Power*, New York City, 5c.
(65) *Official Proceedings*, New York Railroad Club, Brooklyn, N. Y., 15c.
(66) *Journal of Gas Lighting*, London, England, 6d.
(67) *Cement and Engineering News*, Chicago, Ill., 25c.
(68) *Mining Journal*, London, England, 6d.
(69) *Der Eisenbau*, Leipzig, Germany.
(70) *Engineering Review*, New York City, 10c.
(71) *Journal*, Iron and Steel Inst., London, England.
(71a) *Carnegie Scholarship Memoirs*, Iron and Steel Inst., London, England.
(72) *American Machinist*, New York City, 15c.
(73) *Electrician*, London, England, 18c.
(74) *Transactions*, Inst. of Min. and Metal., London, England.
(75) *Proceedings*, Inst. of Mech. Engrs., London, England.
(76) *Brick*, Chicago, Ill., 10c.
(77) *Journal*, Inst. Elec. Engrs., London, England, 5s.
(78) *Beton und Eisen*, Vienna, Austria, 1, 50m.
(79) *Forscherarbeiten*, Vienna, Austria.
(80) *Tonindustrie Zeitung*, Berlin, Germany.
(81) *Zeitschrift für Architektur und Ingenieurwesen*, Wiesbaden, Germany.
(82) *Mining and Engineering World*, Chicago, Ill., 10c.
(83) *Progressive Age*, New York City, 15c.
(84) *Le Ciment*, Paris, France.
(85) *Proceedings*, Am. Ry. Eng. Assoc., Chicago, Ill.
(86) *Engineering-Contracting*, Chicago, Ill., 10c.
(87) *Railway Engineering and Maintenance of Way*, Chicago, Ill., 10c.
(88) *Bulletin* of the International Ry. Congress Assoc., Brussels, Belgium.
(89) *Proceedings*, Am. Soc. for Testing Materials, Philadelphia, Pa., $5.
(90) *Transactions*, Inst. of Naval Archts., London, England.
(91) *Transactions*, Soc. Naval Archts. and Marine Engrs., New York City.
(92) *Bulletin*, Soc. d'Encouragement pour l'Industrie Nationale, Paris, France.
(93) *Revue de Métallurgie*, Paris, France, 4 fr. 50.
(94) *The Boiler Maker*, New York City, 10c.
(95) *International Marine Engineering*, New York City, 20c.
(96) *Canadian Engineer*, Toronto, Ont., Canada, 10c.
(98) *Journal*, Engrs. Soc. Pa., Harrisburg, Pa., 30c.
(99) *Proceedings*, Am. Soc. of Municipal Improvements, New York City, $2.
(100) *Professional Memoirs*, Corps of Engrs., U. S. A., Washington, D. C., 50c.
(101) *Metal Worker*, New York City, 10c.
(102) *Organ für die Fortschritte des Eisenbahnwesens*, Wiesbaden, Germany.
(103) *Mining and Scientific Press*, San Francisco, Cal., 10c.
(104) *The Surveyor and Municipal and County Engineer*, London, England, 6d.
(105) *Metallurgical and Chemical Engineering*, New York City, 25c.
(106) *Transactions*, Inst. of Min. Engrs., London, England, 6s.
(107) *Schweizerische Bauzeitung*, Zürich, Switzerland.
(108) *Southern Machinery*, Atlanta, Ga., 10c.

LIST OF ARTICLES

Bridges.

The Ohio River Highway Bridge at Sewickley.* V. R. Covell. (58) Oct.
Bridging of the Gamtoos River.* (From *South African Railway Magazine.*) (87) Dec.
A Highway Bridge with Provision for a Future Drawspan; Trail, B. C.* E. E. Howard. (13) Dec. 5.
The New Pontoon Bridge at Constantinople.* (12) Dec. 6.
Substructure of the East Haddam Bridge, Special Reinforced Concrete Girder Abutment on Eccentric Columns and a Reinforced Concrete Pivot Pier with Three Tiers of Pockets.* (14) Dec. 7.
City Bridge Floors under Heavy Traffic. (14) Dec. 7.
The New O.-W. R. & N. Bridge at Portland, Oregon.* W. P. Hardesty. (13) Dec. 12.
The Glen Loch Bridge Wreck.* (13) Dec. 19.
Larimer Ave. and Atherton Ave. Concrete Arch Bridges, Pittsburgh.* (13) Dec. 19.

*Illustrated.

Bridges—(Continued).

Supporting a Large Derrick from a Steel Bridge Tower.* (14) Dec. 21.
Large Reinforced Concrete Bridges in Pittsburgh.* N. S. Sprague. (Abstract of paper read before the National Assoc. of Cement Users.) (14) Dec. 21.
Constructional and Economic Features of Recent Concrete Bridge Work in Pittsburgh, Pa.* (86) Dec. 25.
A Successful Floating Concreting Plant for Bridge Construction.* Clement E. Chase. (86) Dec. 25.
The Electrical Equipment of the Hawthorne Avenue Bridge, Portland, Oregon.* (96) Dec. 26.
The 523½-Ft. Steel Arch Bridge over the Sanaga River, Cameroon, South Africa.* K. A. Muellenhoff. (13) Dec. 26.
Engineering Problems in the Foundations for a Cleveland Viaduct. A. M. Felgate. (Paper read before the Cleveland Eng. Soc.) (62) Dec. 30.
Warthebrücke bei Neustadt i. Posen.* Meyer. (40) Nov. 30.
Die neue Weichselbrücke bei Marienwerder.* Rhotert. (102) Dec. 1.

Electrical.

Yellow Flame Arcs.* Maurice Solomon. (77) Nov.
Power Generation and Distribution in the Clyde Valley Electrical Power Company's Area.* David A. Starr. (77) Nov.
Homopolar Generators.* Ernest W. Moss and J. Mould. (Abstract.) (77) Nov.
The Choice of Material for Overhead Line Conductors.* E. V. Pannell. (77) Nov.
High-Voltage Testing Transformers.* R. G. Parrott. (Abstract.) (77) Nov.
An Account of Some Experiments Made with Various Wireless Telegraphy Transmitters and a Complete Description of an Inexpensive Apparatus for Use Over Short Distances. Philip R. Coursey. (Abstract.) (77) Nov.
The Transmission of Electrical Energy by Direct-Current on the Series System.* J. S. Highfield. (77) Nov.
Condensers in Series with Metal Filament Lamps.* A. W. Ashton. (77) Nov.
The Four-Terminal Conductor and the Thomson Bridge. Frank Wenner. (Abstract from *Bulletin*, Bureau of Standards.) (73) Nov. 29.
Armature Reaction in Lap-Wound Machines. W. Lulofs. (73) Serial beginning Nov. 29.
The Loading of Submarine Telephone Cables. J. G. Hill. (26) Serial beginning Nov. 29.
Comparative Tests on High-Tension Suspension Insulators.* P. W. Sothman. (42) Dec.
High Frequency Tests of Line Insulators.* L. E. Imlay and Percy H. Thomas. (42) Dec.
A Method of Improving the Sensitiveness of the Telephone Receiver as a Detector in Alternating Current Null Measurements. Phillips Thomas. (3) Dec.
The Economical Speed Control of Alternating-Current Motors Driving Rolling Mills.* F. W. Meyer and Wilfred Sykes. (42) Dec.
Application of the Selenium Cell to Photometry.* A. H. Pfund. (Abstract from the *Physical Review.*) (73) Dec. 6.
Erecting Tall Wireless Towers at Arlington.* (14) Dec. 7.
Reinforced Concrete Telegraph Pole Tests. (14) Dec. 7.
Design of Piping for Transformer Oil, Air and Cooling Water.* Fred Buch. (27) Dec. 7.
The Reduction in the Cost of Electric Lighting Abroad.* (13) Dec. 12.
The Oil-Drop Method of Studying Electrical Phenomena in Gases. R. A. Millikan. (Abstract of paper read before the Am. Electrochemical Soc.) (73) Dec. 13.
Some Considerations in Connection with Electrically Driven Non-Reversing Mills. S. H. Eckmann. (73) Dec. 13.
Electric Cranes in Iron and Steel Works.* H. H. Broughton. (73) Dec. 13.
Electric Control Gear for Iron and Steel Works.* J. M. L. Slater and F. C. Hall. (73) Dec. 13.
The Selection and Care of Electrical Machinery in Steelworks.* J. Arthur Sykes. (73) Dec. 13.
Electric Furnaces in the Manufacture of Steel. Edward F. Law. (73) Dec. 13.
Induction Furnaces and Their Relation to the Steel Industry.* Joh. Härden. (73) Dec. 13.
The Electric Arc Furnace in Steel Production.* W. S. Gifford. (73) Dec. 13.
Electrical Plant for Driving the Reversing Rolling-Mill at the Skinningrove Ironworks.* (73) Dec. 13.
The Shaw Electric Monorail System of Travelling Cranes.* (18) Dec. 14.
Electricity *versus* Gas for Street Lighting. T. Osborne. (27) Dec. 4.
The Change of Energy Loss with Speed in Direct-Current Machines.* W. M. Thornton. (73) Dec. 20.
The Billiter Alkali-Chlorine Cells.* A. G. Allmand. (Abstract of paper read before the Faraday Soc.) (73) Dec. 20.
The New Wireless Telegraph Station at Fort Myer, Virginia.* Davis H. Tuck and Millard B. Hodgson. (26) Dec. 20.

*Illustrated.

Electrical—(Continued).

Electric Power Testing Set.* James C. Bennett. (16) Dec. 21.
Porcelain-Clad Reactors.* (27) Dec. 21.
Electric Development in New England.* (27) Dec. 28.
Disturbances of Potential and Current Produced in an Active Conducting Network by the Application of a Leak Load.* A. E. Kennelly. (27) Dec. 28.
High Speed Turbo-Alternators—Designs and Limitations. B. G. Lamme. (42) Jan.
Industrial Lighting.* C. L. Eshleman. (42) Jan.
Les Propriétés Magnétiques des Alliages des Métaux Ferromagnétiques; Fernickel, Nickel-cobalt, Cobalt-fer. P. Weiss. (Paper read before the Inter. Assoc. for Testing Materials.) (93) Dec.
Untersuchungen über magnetische Hysteresis.* F. Holm. (48) Oct. 26.
Einphasenwechselstrom-Kollektormotoren.* M. Latour. (41) Nov. 28.
Selbstkosten von Gasanstalten und Elektrizitätswerken. Friedrich Ross. (41) Nov. 28.
Vereinfachte Berechnung der Spannungsverhältnisse bei Freileitungen mit hohen Spannungen.* Nils Forssblad. (41) Dec. 5.
Ueber Selbsterregung und Nutzbremsung von Maschinen mit Reihenschlusscharakteristik.* A. Scherbius. (41) Dec. 5.
Eine neue künstliche Leitung zur Untersuchung von Telegraphierströmen und Schaltvorgängen.* Karl Willy Wagner. (41) Serial beginning Dec. 12.
Zur Berechnung der mittleren Beleuchtung rechteckiger Flächen.* Adolf Thomälen. (41) Dec. 19.

Marine.

Electrical Working of Auxiliary Machinery on Modern Steamships.* E. T. Caparn. (Abstract.) (77) Nov.
The Uses of Gases on Ships for Fire Extinction and Fumigation. E. Kilburn Scott, A. M. Inst. C. E. (Paper read before the Inst. of Marine Engrs.) (47) Nov. 29.
Performance of a Dipper Dredge Driven by Oil Engines on Drainage Ditch Excavation. (13) Dec. 5.
Modern Painting Methods in the Navy: The Government Now Its Own Manufacturer of Paints. Henry Williams. (Paper presented to the Eighth Inter. Cong. of Applied Chemistry.) (19) Dec. 7.
Use of Oil Fuel in the United States Navy. H. I. Cone. (Abstract of paper read before the Eighth Inter. Cong. of Applied Chemistry.) (13) Dec. 19.
Geared Turbines; Their Development for Ship Propulsion. George Westinghouse. (19) Dec. 21.
Le *Selandia* et le *Jutlandia*, Navires à Moteurs Diesel, de la Compagnie de l'Est-Asiatique Danois. M. Gouriet. (33) Nov. 30.

Mechanical.

On the Measurement of the Air-Supply to Internal Combustion Engines, by Means of a Throttle-Plate. William Watson and Herbert Schofield. (75) Apr.
Furnace Efficiency. Joseph Harrington. (4) Nov.
Purchase of Lubricating Oil by Specification. A. D. Smith. (58) Nov.
Power-Plant Economics.* Horace W. Flashman. (6) Nov.
Coal-Conveying Plant at the Leipzig Gas-Works.* Hubert Hermanns. (66) Nov. 26.
Recent Developments in the Manufacture of Refractory Goods from Fire-Clay. G. H. Pearson-Perry. (Paper read before the Soc. of British Gas Industries.) (66) Nov. 26.
The Measurement of the Flow of Gases in Mains by Means of the Pitot Tube.* A. R. Griggs. (Paper read before the London and Southern District Junior Gas Assoc.) (66) Nov. 26.
Mechanical Haulage. George Symon. (Paper read before the Institution of Mun. Engrs.) (104) Nov. 29.
Some Milling Experiments.* P. V. Vernon. (Abstract of paper read before the Manchester Assoc. of Engrs.) (47) Nov. 29.
Chain Driving.* H. T. Hildage, M. Inst. C. E. (Paper read before the Rugby Eng. Soc.) (47) Nov. 29.
Examples of Milling Machine Work.* (108) Serial beginning Dec.
Hydraulic Cranes, Immingham Docks; Gt. Central Railway.* (21) Dec.
Laboratory on Wheels; Used in Atmospheric Tests by Smoke Abatement Experts.* Hugh Pattison. (60) Dec.
Manufacture of Railway Shovels.* (87) Dec.
Coal Stacking and Coal Firing. H. Kendrick. (Paper read before the Manchester District Institution of Gas Engrs.) (66) Dec. 3.
High-Pressure Gas Lighting. Walter Grafton. (Paper read before the Scottish Junior Gas Assoc.) (66) Dec. 3.
Methods of Laying Submerged Gas Mains Across Two Rivers at New Haven, Conn. H. E. White. (Paper read before the Connecticut Soc. of C. E.) (86) Dec. 4.

*Illustrated.

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Canadian Studies of Peat Fuel in Gas Producers and the Elimination of Tar from Producer Gas.* (13) Dec. 5.
The Molding of Bronze Statuary.* E. A. Suverkrop. (72) Dec. 5.
Motorcycle Work at the Pierce Shop.* Ethan Viall. (72) Dec. 5.
A New Principle in the Design of High-Vacuum Pumps.* (13) Dec. 5.
English Tower Cranes for Building Construction.* (13) Dec. 5.
Universal Boring and Milling Machine with Internal Spindle.* (13) Dec. 6.
A Powerful Slotting Machine.* (12) Dec. 6.
Note on Fly-Wheel Design for Internal Combustion Engines.* Robert Oliphant Boswall. (13) Dec. 6.
Waste Heat Utilization. I. V. Robinson, M. Inst. Mech. Engrs. (Abstract of paper read before the Cleveland Eng. Soc.) (22) Dec. 6.
The Rating and Pricing of Speed Reducing Gear.* E. A. Vessey. (22) Dec. 6.
Open-Hearth Furnace Design and Manipulation.* John Ploehn. (Paper read before the Am. Foundrymen's Assoc.) (47) Dec. 6; (20) Dec. 26.
Mixing, Hoisting and Charging Equipment for Handling Coal and Minerals, Installations for Handling with Automatic Devices 900 Tons of Material a Day.* (14) Dec. 7.
Some Recent Developments in Wood Distillation. Thomas W. Pritchard. (Abstract of paper read before N. Y. Section of Soc. of Chemical Industry.) (19) Dec. 7.
The Barnum Process of Generating Gas.* (24) Dec. 9.
Tests of Wood, Paper and Steel Pulleys.* H. A. Woodworth. (64) Dec. 10.
The Design of Ignition Arches.* Joseph Harrington. (64) Dec. 10.
Small Westinghouse Steam Turbine.* (64) Dec. 10.
Indirect Lighting. F. W. Willcox and H. C. Wheat. (Paper read before the Illuminating Eng. Soc.) (66) Dec. 10.
Vertical Retorts and Continuous Carbonization.* Norton H. Humphreys, Assoc. M. Inst. C. E. (66) Dec. 10.
A Quadrant Crane for Motor Trucks.* (13) Dec. 12.
An Aeroplane Catapult.* (12) Dec. 13; (46) Dec. 14.
Furnace Charging Machines with Special Reference to Open Hearth Works.* J. Smith, A. M. I. Mech. E. (73) Dec. 13.
Pyrometry in Steel Works.* Chas. R. Darling. (73) Dec. 13.
The Manufacture of Seamless Steel Boiler Tubes. J. J. Dunn. (Abstract of paper read before the Am. Boiler Mfrs.' Assoc.) (18) Dec. 14.
How to Overcome Lamination.* (Brick Manufacture.) R. T. Stull. (76) Dec. 15.
Consumers' Meters. Charles C. Schiller. (Paper read before the Am. Gas Inst.) (83) Dec. 16.
Heat Value and Candle Power. (Report of Committee of the Am. Gas. Inst.) (83) Dec. 16.
Some Practical Notes on Retort House Work. Victor White. (24) Dec. 16.
Nashamena Steam Turbine Plant.* Warren O. Rogers. (64) Dec. 17.
The Flow of Steam Through Pipes.* H. V. Carpenter. (64) Dec. 17.
The Residuals Inquiry. (Text of the Report by the Joint Select Committee of the House of Lords and the House of Commons on "Gas Authorities (Residual Products.")) (66) Dec. 17.
Lignite and Its Uses. R. O. Wynne-Roberts. (Paper read before the Regina Eng. Soc.) (96) Dec. 19.
Group and Individual Drives.* A. G. Popcke. (72) Dec. 19.
Stresses and Deflections of Shafts.* A. Schein. (72) Dec. 19.
A Magnetic-Load Machine for Alternating Stress Tension Tests, and Some Results.* (13) Dec. 19.
Aeroplane Engines.* A. Graham Clark. (Paper read before the Institution of Automobile Engrs.) (13) Dec. 20.
The Keymer Rock-Drill.* (13) Dec. 20.
Test-Bars for Chillable Irons.* Thos. D. West. (Paper read before the Inter. Assoc. for Testing Materials.) (13) Dec. 20.
Recent Developments in the Curtis Steam Turbine.* R. F. Halliwell. (Paper read before the Manchester Assoc. of Engrs.) (47) Serial beginning Dec. 20.
The Crosby Automatic Boiler-Feed Regulator. (13) Dec. 20.
Flat Surfaces Supported by Stay Bolts.* A. J. Toppin. (64) Dec. 24.
The Low-Temperature Modification of Bituminous Coals to Form a Smokeless Domestic Fuel.* (Abstract from *Bul.*, Univ. Ill. Eng. Exper. Station.) (13) Dec. 26.
The Case of the Oil Engine. William T. Price. (Paper read before the Philadelphia Foundrymen's Assoc.) (20) Dec. 26.
Freight Handling System for a Warehouse, Telpherage System for Handling Detachable Motor Truck Bodies Loaded with Packages of Miscellaneous Sizes.* (14) Dec. 28.
The Manufacture of Manila Rope; Its Use for Transmission and Hoisting.* C. W. Hunt. Dec. 28.
The Photometry of Incandescent Gas Lamps.* C. O. Bond. (Paper read before the Am. Gas Inst.) (24) Dec. 30.

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Mechanical—(Continued).

Lentz System Applied to Steam Engine.* Sigfried Rosenzweig. (Paper read before the Ohio Soc. of Mech. Elec. and Steam Engrs.) (64) Dec. 31.
Progress of Wolf Locomobile Engines.* F. E. Junge. (64) Dec. 31.
Procedure in Coal Specifications. Mervin K. Baer. (64) Dec. 31.
Les Trains Planétaires, leur Théorie et leur Application aux Réducteurs et Multiplicateurs de Vitesse.* P. Laruelle. (37) Nov. 30.
Presses à Agglomérer les Charbons, pour la Fabrication des Boulets Ovoïdes, Construites par les Fonderies et Ateliers de Construction de l'Horme (Loire).* (34) Dec.
Enregistrement Automatique de la Relation entre les Efforts et la Déformation des Matériaux lors du Choc.* André Gagarine. (Paper read before the Inter. Assoc. for Testing Materials.) (93) Dec.
Recherches Expérimentales sur les Métaux Antifriction pour Machines.* Nino Pecoraro. (Paper read before the Inter. Assoc. for Testing Materials.) (93) Dec.
Application à la Fonte de Méthodes d'Essais Mécaniques Adoptées pour les Autres Métaux.* A. Damour. (Paper read before the Inter. Assoc. for Testing Materials.) (93) Dec.
IIe Concours de Pare-Boue de l'Automobile-Club de Seine-et-Oise (Versailles, 1912).* E. Bret. (33) Dec. 14.
Eine Drahtseilbahnanlage von ungewöhnlichen Abmessungen.* Adolf Bleichert. (81) Pt. 6.
Die Herstellung von Qualitätsguss unter Verwendung von Metallspänen.* J. Mehrtens. (48) Oct. 26.
Neuere Bestrebungen im Dampfkesselbau.* Friedrich Münzinger. (48) Serial beginning Oct. 26.
Ueber die Wahl der Geschwindigkeitsdiagramme von Francis-Turbinen.* K. Körner. (48) Oct. 26.
Zur Schleiftechnik in der Giessereibetrieben der Vereinigten Staaten von Nordamerika.* C. Krug. (50) Nov. 28.
Selbstkosten von Gasanstalten und Elektrizitätswerken. Friedrich Ross. (41) Nov. 28.

Metallurgical.

Methods of Preparing Cuban Brown Iron Ore for Blast Furnace Use. R. B. Gerhardt. (98) Nov.
The Black Oak Mill.* Charles H. Urquhart. (103) Nov. 30.
Hydraulic Classification. (Pulp for Tube Milling.) G. A. Robertson. (105) Dec.
Recent Copper Milling Practice at Lake Superior.* (105) Dec.
The Function of the Slag in Electric Steel Refining. Richard Amberg. (Paper read before the Inter. Cong. of Applied Chemistry.) (22) Dec. 6.
The Electric Furnace for Brass Melting. G. H. Clamer and Carl Hering. (Abstract of paper read before the Am. Inst. of Metals.) (47) Dec. 6.
The Froth Flotation Process. H. L. Sulman. (Paper read before the Inst. of Mines and Metallurgy.) (16) Dec. 7.
Nipissing High-Grade Mill, Cobalt.* R. B. Watson. (16) Dec. 7.
Iron and Steel Smelting in Electro-Metals Furnaces. T. D. Robertson. (73) Dec. 13.
Nipissing High-Grade Mill, Cobalt. Herbert A. Megraw. (16) Dec. 14.
Mechanical Efficiency in Crushing.* Algernon Del Mar. (16) Dec. 14.
Evolution of an Electrolytic Refinery. Harold French. (103) Serial beginning Dec. 14.
Amalgamation at the Homestake.* Allan J. Clarke and W. J. Sharwood. (103) Dec. 14.
Progress in Steel Making in Alabama. Frank H. Crockard. (From Alabama Geol. Survey Publication.) (20) Dec. 19.
Induction Furnaces for Steel Refining. John B. C. Kershaw. (12) Serial beginning Dec. 20.
The Open Hearth Furnace for Malleable Cast Iron. G. A. Blume. (Abstract of paper read before the Am. Foundrymen's Assoc.) (22) Dec. 20.
Hollinger Cyanide Mill, Porcupine.* Herbert A. Megraw. (16) Dec. 21.
Cyanide Practice in the Black Hills.* Herbert A. Megraw. (16) Dec. 28.
Rapport sur les Progrès de la Metallographie depuis la Commencement de l'Année 1909 jusqu'à la Fin de 1911.* E. Heyn. (Report of Comm. to Inter. Assoc. for Testing Materials.) (93) Dec.
Les "Inclusions de Scories." Walter Rosenhain. (Report to Inter. Assoc. for Testing Materials.) (93) Dec.
Principes Généraux pour les Conditions de Réception du Cuivre. Léon Guillet. (Report of Comm. to Inter. Assoc. for Testing Materials.) (93) Dec.
De la Soudure des Soufflures et Cavités du Lingot d'Acier.* J. E. Stead. (Paper read before the Inter. Assoc. for Testing Materials.) (93) Dec.
La Biographie de la Cémentite Pro-Eutectoïde.* Henry M. Howe et Arthur G. Levy. (Paper read before the Inter. Assoc. for Testing Materials.) (93) Dec.

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Metallurgical—(Continued).

Note sur la Croissance Cristalline de la Ferrite Au-Dessous de sa Zone Critique de Température.* Albert Sauveur. (Paper read before the Inter. Assoc. for Testing Materials.) (93) Dec.

La Désintégration Electrique des Métaux et son Emploi Possible pour les Essais.* Carl Benedicks. (Paper read before the Inter. Assoc. for Testing Materials.) (93) Dec.

Les Impuretés Solides Non-Métalliques de l'Acier Sonims.* Henry D. Hibbard. (Paper read before the Inter. Assoc. for Testing Materials.) (93) Dec.

Etudes Micrographiques, Mémoire sur Quelques Observations Micrographiques Ayant Amené des Résultats Pratiques, dans la Réception, l'Examen ou le Mode de Travail de Différents Métaux.* (Paper read before the Inter. Assoc. for Testing Materials.) (93) Dec.

Ueber den Einfluss des Arsens auf die Eigenschaften des Flusseisens.* J. Liedgens. (50) Dec. 19.

Military.

The Military Supremacy of the Air: The Aeronautic Plans of Great Military Powers. Theodore M. R. von Kéler. (46) Serial beginning Dec. 28.

Mining.

The New Rand Goldfield.* A. R. Sawyer. (Paper read before the North Staffordshire Inst. of Min. and Mech. Engrs.) (106) Vol. 44, Pt. 1.

The Illumination at the Coal-Face with Special Reference to the Incidence of Miners' Nystagmus. T. Lister Llewellyn. (Paper read before the South Staffordshire and Warwickshire Inst. of Min. Engrs.) (106) Vol. 44, Pt. 1.

Maltby Main Colliery. Alfred Thompson. (Paper read before the Midland Inst. of Min., Civ. and Mech. Engrs. and the Midland Counties Institution of Engrs.) (106) Vol. 44, Pt. 1.

Some Experiences with Winding-Ropes and Capels. W. D. Lloyd. (Paper read before the Midland Inst. of Min., Civ. and Mech. Engrs.) (106) Vol. 44, Pt. 1.

Facts and Theories Relating to Fans. David M. Mowat. (Paper read before the Midland Inst. of Min., Civ. and Mech. Engrs.) (106) Vol. 44, Pt. 1.

The Ignition of Coal-Gas and Methane by Momentary Electric Arcs.* W. M. Thornton. (Paper read before the North of England Inst. of Min. and Mech. Engrs.) (106) Vol. 44, Pt. 1.

Electrically-Driven Winding-Engines in South Africa.* A. W. Brown. (106) Vol. 44, Pt. 1.

The Use of Old Wire Ropes in Timbering Roadways. John McLuckie. (Paper read before the Min. Inst. of Scotland.) (106) Vol. 44, Pt. 1.

The Effects of Deficiency of Oxygen on the Light of a Safety-Lamp. J. S. Haldane and T. Lister Llewellyn. (Paper read before the South Staffordshire and Warwickshire Inst. of Min. Engrs.) (106) Vol. 44, Pt. 1.

The Energy of Explosives.* Walter O. Snelling. (58) Oct.

The Chuichos Coal Mine, Peru. Lester W. Strauss. (6) Nov.

Notes on Diamond Drilling. Albert E. Hall. (6) Nov.

The Electrification of a Group of Small Collieries. Campbell King. (Paper read before the Assoc. of Min. Elec. Engrs.) (22) Nov. 29.

The Mount Lyell Disaster.* Hartwell Conder. (68) Nov. 30.

The Production of Available Potash from the Natural Silicites. Allerton S. Cushman and George W. Coggeshall. (3) Dec.

Application of Concrete to Underground Works.* H. T. Mercer. (Paper read before the Lake Superior Min. Inst.) (96) Dec. 5.

Large Synchronous Motors for Compressor Service (Mining Operations).* Girard B. Rosenblatt. (103) Dec. 7.

Marquette Range Shows Continued Progress.* (82) Dec. 7.

Electricity in Metal Mining in Colorado.* W. J. Canada. (27) Dec. 7.

The Santa Maria Graphite Mines, Mexico.* W. D. Hornaday. (82) Dec. 7.

Insect Damage to Mine Props and Its Prevention. T. E. Snyder. (82) Dec. 7.

Methods and Cost of Drilling in the California Oilfields.* A. T. Parsons. (86) Dec. 11.

100-Horse-Power Electrically Driven Hauling Gear.* (12) Dec. 13.

Recording the Ventilation in Mines.* (22) Dec. 13.

The Wellesley Colliery of the Wemyss Coal Co., Ltd.* Jas. D. Welch. (Paper read before the Scottish Federated Inst. of Min. Students.) (22) Dec. 13.

Square-Set Timbering: Importance and Evolution. Claude T. Rice. (82) Serial beginning Dec. 14.

Application of Electric Power for Coal Mining.* S. R. Stone. (82) Dec. 14.

The Treasury Tunnel Raise. H. T. Russel. (16) Dec. 14.

Mine Slope Economizing Hand Labor.* John J. Smith. (16) Dec. 21.

No. 5 Tunnel, Mammoth Mine, California.* Robert E. Hanley. (16) Dec. 21.

Mining Methods in the Waihi Mine.* Jas. L. Gilmour and W. H. Johnston. (From *Proceedings*, Australasian Inst. of Min. Engrs.) (103) Dec. 21.

The Federal Government and Mineral Lands. W. C. Mendenhall. (82) Dec. 21.

Obtaining Efficiency in Mining. Andre Formis. (16) Dec. 28.

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Miscellaneous.

The Manufacture of Sugar from Wood, and its Economic Importance. A. Zimmermann. (29) Dec. 6.
The Quartz Mercury Vapour Lamp.* (22) Dec. 6.
Two Conflicting Theories of Valuation of Public Service Companies. Halbert P. Gillette. (86) Dec. 11.
A German Code of Fees. (13) Dec. 12.
Natural and Synthetic Rubber. F. Mollwo Perkin. (29) Dec. 13.
The Parcels Post Zone System.* Emma M. V. Triepel. (46) Dec. 14.
Die Dampkraft und andere Energiequellen im zukünftigen Transportwesen.* Leopold Kliment. (53) Serial beginning Dec. 6.

Municipal.

Temperature Strains in Brick Pavements.* James E. Howard. (60) Dec.
Methods and Cost of Roadway Reconstruction in the Lincoln Park System, Chicago, during 1911.* M. M. Lawrence. (86) Dec. 4.
Method and Cost of Levelling Dredged-Over Ground with Electrically Driven Drag Scraper.* James C. Bennett. (86) Dec. 4.
Brantford Concrete Pavements.* T. Harry Jones, M. Can. Soc. C. E. (96) Dec. 5.
Tests of Road Stones in the United States. (From *Bulletin*, U. S. Office of Public Roads.) (104) Dec. 6.
Sand-Clay Roads in North Carolina. (14) Dec. 7.
The Splinter Treatment and Waste Sulphite Liquor Oil Sand Treatment as Practiced in Connecticut. Maurice O. Eldridge, Assoc. M. Am. Soc. C. E. (86) Dec. 11.
Plant Equipment for Road Construction. F. E. Ellis. (Paper read before the Am. Good Roads Congress.) (86) Dec. 11.
Maintenance and Repair of New York State Highways in 1911. (From Annual Report, N. Y. State Comm. of Highways.) (96) Dec. 12.
Road Building at a Mile-per-Day Rate. G. Howland Leavitt. (Abstract of paper read before the Am. Road Builders' Assoc.) (14) Dec. 14.
Town Planning from an Engineering Aspect. Ernest R. Matthews. (Abstract of paper read before the Soc. of Engrs.) (14) Dec. 14.
Some Features of Macadam Construction. T. R. Agg. (Abstract of paper read before the Am. Road Builders' Assoc.) (14) Dec. 14.
Wood Block Pavement Laid by City Labor. Ellis R. Dutton. (Abstract of paper read before the Am. Road Builders' Assoc.) (14) Dec. 14; (60) Dec.
Bituminous Pavements for City Streets. George W. Tillson. (Abstract of paper read before the Am. Road Builders' Assoc.) (14) Dec. 14.
Methods and Costs of Street Cleaning at Washington, D. C., during 1911-12. (86) Dec. 18.
The Resurfacing of 102 Miles of Highway in Five Months. (86) Dec. 18.
Experience with Bituminous Roads and Road Treatment. William B. Sohier. (Abstract of paper read before the Am. Road Builders' Assoc.) (14) Dec. 21.
Proposed Traffic Regulation on Fifth Avenue, New York. (14) Dec. 21.
Methods and Labor Costs of Concrete Pavement Construction at Davenport, Ia., by Hand Mixing and by Machine Mixing.* W. S. Anderson. (86) Dec. 25.
Town Planning and Civic Improvement. C. H. Mitchell. (96) Dec. 26.
A Successful Budget-Method Protest, Illustrated by Extracts from the Report of the Bureau of Street Cleaning, Richmond Borough, New York City. (13) Dec. 26.
Concrete Construction of the Watertown Plank Road, Wisconsin.* H. J. Kuelling. (13) Dec. 26.
Concrete Pavements Tamped with Mechanical Vibrator. (14) Dec. 28.
Nouveau Système Economique de Rechargement des Chaussées Empierrées. A. Sallé. (35) Sept.
Strassenteerungen.* Hentrich. (39) Nov. 20.
Die Abwässer der Fabriken als Strassenstaubbekämpfungsmittel. (39) Nov. 20.
Das Automobil auf der Landstrasse und die Staubplage. Metzmacher. (39) Nov. 20.
Die Radrennbahn Zürich-Oerlikon.* M. Scheifele. (107) Serial beginning Dec. 7.

Railroads.

Headlights Tests. C. M. Larson. (61) Oct. 15.
Mechanical Transferage at Railway Shops and Terminals.* H. McL. Harding. (61) Nov.
Electrification of the Melbourne Railways. Charles Merz. (Report presented to the Government.) (12) Nov. 29.
Mallet Articulated Compound Locomotive (2-8-8-0 Type), G. N. R., U. S. A.* (11) Nov. 29.
Sugden's Superheater.* (11) Nov. 29.
Electrification of Main Lines. G. Brecht. (Translated from *Elektrische Kraftbetriebe.*) (73) Serial beginning Nov. 29.
Railroad Valuation: Reproduction Cost New as a Sole Basis for Rates. D. F. Jurgensen. (Paper read before the Civ. Engrs'. Soc. of St. Paul.) (1) Dec.

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Railroads—(Continued).

Concrete Practice, No. 5, C. C. & St. L. Ry. Co.* A. M. Wolf. (87) Dec.
Standard Signal Practice on the L. & N.* B. W. Meisel. (87) Dec.
2-6-0 Express Goods Engines, Great Northern Railway.* (21) Dec.
Bogie Carriages for the Chilian Longitudinal Railway—Northern Section.* (21) Dec.
New Locomotives, Northern of France Railway.* (21) Dec.
Bulgarian Railway Locomotives.* (21) Dec.
Watervliet Terminal, Delaware & Hudson Co.* J. C. Chapple. (87) Dec.
Northumberland Yard, Northern Central Ry.* (87) Dec.
Temperature Tests on Superheater Locomotives.* (25) Dec.
Largest Narrow Gage Locomotives.* (25) Dec.
The Progress in Testing Full-Size Pieces Under Practical Conditions, Together with Locomotive Testing in the United States. Gaetano Lanza. (3) Dec.
A High-Speed German Compound Locomotive with Schmidt Superheater.* Frank C. Perkins. (94) Dec.
Notes on the Working of Coupling Rods.* G. L'Hoest. (88) Dec.
Electrically-Operated Suspension Lines in Goods Sheds.* Fenten. (From *Zeitung* des Vereins deutscher Eisenbahnverwaltungen.) (88) Dec.
The Locomotive Superheater and Some of Its Effects on the Cost of Railway Operation.* Gilbert E. Ryder. (65) Dec.
The Construction of a West African Railway.* G. M. Harris. (Paper read before the Inst. of Civil Engrs. of Ireland.) (96) Dec. 5.
State Railroads of the Dutch East Indies. D. C. Alexander, Jr. (Abstract from *Daily Consular and Trade Reports.*) (20) Dec. 5.
Rail Anchors or Anti-Creepers.* (13) Dec. 5.
Lana-Vigiljoch Aerial Cable-Way.* (12) Dec. 6.
Derailment at Glen Loch, Pa.* (15) Dec. 6.
The Hopatcong-Slateford Cut-Off.* C. W. Simpson. (15) Dec. 6.
A Gateway to the Heart of New York: The New Grand Central Station and Its Relation to New York Traffic.* (19) Dec. 7; (46) Dec. 7; (27) Dec. 21.
The Optics of a Railway Signal Lamp.* T. A. Lawes. (19) Dec. 7.
Methods of Promoting Efficiency in Maintenance on the Pittsburgh and Lake Erie.* (14) Dec. 7.
Driving and Lining the New Sand Patch Tunnel.* (14) Dec. 7.
Pacific and Mikado Type Locomotives for the New Orleans, Mobile and Chicago R. R.* (18) Dec. 7.
Mountain Cableway for Passengers in Austria.* Francis P. Mann. (14) Dec. 7.
The Windsor, Essex and Lake Shore Rapid Railway.* (96) Dec. 12.
Rail Corrugations.* H. T. Wakelam. (Paper read before the Institution of Mun. and County Engrs.) (104) Dec. 13.
Cause of the Glen Loch Derailment. (15) Dec. 13.
Efficient Organization for Handling Salvage.* H. C. Pearce. (15) Dec. 13.
Repair Shop of the New York, Westchester & Boston Railway.* (17) Dec. 14.
Railroad Rates and Rate Making. O. P. Gothlin. (Abstract from Report of the Public Service Comm. of Ohio.) (18) Dec. 14.
Headlight Tests, Railroad Commission of Wisconsin. (18) Dec. 14.
Electrification of the London and North-Western Suburban Lines.* (12) Dec. 20.
Tunnel Memorials.* (12) Dec. 20.
Locomotive Feed Water Heating.* (12) Dec. 20.
The Country's Need of Greater Railroad Facilities. James J. Hill. (Abstract of paper read before the Ry. Business Assoc.) (15) Dec. 20; (18) Dec. 21.
Chrome-Vanadium Driving Wheel Tires.* (15) Dec. 20.
Prolonging the Life of Crossties.* Howard F. Weiss. (From *Bulletin 118*, U. S. Forest Service.) (15) Dec. 20.
Keeping Stone Ballast Clean. C. E. Lindsay. (15) Dec. 20.
Solution of the Steel Rail Problem.* (46) Dec. 21.
The Westport Disaster: Report of the Connecticut Public Utilities Commission.* (19) Dec. 21; (15) Dec. 13; (18) Dec. 14.
Electric Express Service at Boston.* (17) Dec. 21.
Grade Revision and Double-Tracking on the A. T. & S. F. Ry.* J. G. Van Zandt. (18) Dec. 21.
The Glen Loch Wreck, More Facts.* Charles A. Wentworth. (13) Dec. 26.
An Automatic Stop Experiment on the Lackawanna. (15) Dec. 27.
Engineering and Operating Features of the Tri-City Railway, Davenport, Ia.* (17) Dec. 28.
Oil-Burning Locomotives for the Baltimore & Ohio R. R.* (18) Dec. 28.
Specifications for Heat-Treated Chrome Vanadium Steel Tires.* (18) Dec. 28.
Six-Tracking a Heavy-Traffic Line and Elevating for Grade-Crossing Elimination, Pennsylvania Railroad Improvement at Rahway, N. J.* (14) Dec. 28.
Souterrain de la Gare de Paris-Nord pour le Transport des Bagages. Sabourin et Théry. (38) Oct.
Note sur les Nouvelles Voitures de la Cie. de Bône-Guelma et Prolongements (Réseau à Voie de 1m.).* Félix. (38) Oct.
Les Chemins de Fer du Massif du Mont-Blanc, le Funiculaire aérien de l'Aiguille du Midi.* P. Dalimier. (33) Nov. 23.

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Le Métropolitain Souterrain à Marchandises de Chicago.* (33) Nov. 30.
Nouveau Dépot de Locomotives de Mohon.* Henry et Valat. (38) Dec.
Locomotive-Tender à Six Essieux Couplés et à Surchauffe, des Chemins de Fer de Java.* (33) Dec. 14.
Bearbeitung der Heizrohre der Lokomotiven in der Werkstätte Pilsen.* Karl Kramár. (102) Nov. 15.
Achsbüchse von Cosmovici.* (102) Nov. 15.
Ablaufanlagen auf Verschiebebahnhöfen für reinen Schwerkraftsbetrieb.* Sammet. (102) Serial beginning Nov. 15.
Die erste mit Zwischenstützen versehene Personen-Bergseilschwebebahn deutscher Bauart.* M. Buhle. (40) Nov. 23.
Der elektrische Betrieb auf der alten Giovi-Linie zwischen Genua und Mailand bzw. Genua und Turin.* Giorgio Calzolari. (41) Serial beginning Nov. 28.
Oberbau mit gusseisernen Stühlen.* E. C. W. van Dyk. (102) Dec. 1.
Tenderlokomotive für die Staatsbahnen auf Java; Hannover'sche Maschinenbau-Aktien-Gesellschaft.* Hinnenthal. (102) Dec. 1.
Elektrisches Huppensignal.* Becker. (102) Dec. 1.
Die Einführung der linksufrigen Zürichseebahn in den Hauptbahnhof Zürich der S. B. B.* Otto Pfleghard. (107) Dec. 14.

Railroads, Street.

Central London Railway Extension to Liverpool Street.* (12) Nov. 29.
Composite Rail Laying on Chicago Street Railways; the Economics of Composite Rails.* (86) Dec. 4.
Street Railway Track Work at Toledo.* A. Swartz. (13) Dec. 5.
Rapid-Transit and Highway Tunnels for San Francisco.* (13) Dec. 5.
Relief of Traffic Congestion in San Francisco. Bion J. Arnold. (Abstract of Report to the City Board of Supervisors of San Francisco.) (14) Dec. 7.
Brooklyn Car Equipment Lubrication.* (17) Dec. 7.
Recent Funeral Cars.* (17) Dec. 7.
Unit System of Subway Construction.* A. R. Eitzen. (15) Dec. 13.
Recent Developments in Street Car Design.* (18) Dec. 14.
Excavation and Timbering on Section 2, Lexington Avenue Subway.* (14) Dec. 14.
Near-Side Cars for Lincoln.* (17) Dec. 14.
New Type of Joint in Baltimore.* (17) Dec. 21.
Der Métropolitain Souterrain à Marchandises de Chicago.* (33) Nov. 30.
Der elektrische Betrieb auf den Berliner Stadt-, Ring- und Vorortbahnen. (41) Serial beginning Dec. 5.
Strassenbahngleise aus Eisenbeton.* Max Buchwald. (78) Dec. 14.

Sanitation.

The Principles of Municipal Refuse Collection.* Samuel A. Greeley. (4) Nov.
The Sewage Disposal System of Rochester, N. Y.* John F. Skinner, M. Am. Soc. C. E. (36) Dec.
Laying a Submerged Outlet Pipe.* N. Adelbert Brown. (36) Dec.
The Collection and Disposal of Municipal Refuse. Jerome Cochran, Jun. Am. Soc. C. E. (36) Serial beginning Dec.
Sewer System and Sewage Disposal Plant at Belton, Texas.* Thomas L. Fountain. (36) Dec.
To What Degree Must Sewage Be Purified? Chester G. Wigley. (36) Dec.
The Use of Concrete in Sewers.* (60) Dec.
Sewerage of the City of Portland.* T. M. Hurlburt. (Paper read before the Oregon Soc. of Engrs.) (1) Dec.
Utilisation of Humus from Slate Beds. W. J. Dibdin. (Paper read before the Soc. of Chemical Industry.) (104) Dec. 6.
Steam Heating in a Montana Garage.* (101) Dec. 6.
Temperature Equivalents of Wind Velocities. H. W. Whitten. (Paper read before Am. Soc. of Heating and Ventilating Engrs.) (101) Dec. 6.
Glasgow Main Drainage Scheme: One of the Largest Installations of Its Kind in the World.* Frank I. Cohen. (19) Dec. 7.
Sewerage System and Disposal Plant at Phœnix, Arizona.* (14) Dec. 7.
Disintegration of Concrete in Sewage Disposal Plants. (14) Dec. 7.
The Effect of Safe Water Supplies on the Typhoid Fever Rate. Allan J. McLaughlin. (Abstract of paper read before the Assoc. of Life Insurance Presidents in New York City.) (96) Dec. 12.
A Factory Refuse Removal System: Proportions and Design of Blower Piping and Other Shavings Removal Equipment of a Woodworking Plant.* (101) Dec. 13.
The Effect of Intercepting Traps in House Drainage. Edward Willis. (Paper read before the Lower Thames Valley District Surveyors' Assoc.) (104) Dec. 13.
Lethbridge Sewage Disposal Works.* T. Aird Murray. (14) Dec. 14.
The Sanitary Control of the Ruhr River, Germany.* Richard H. Gould. (13) Dec. 19.
A Turbine Sewer-Cleaning Machine.* (13) Dec. 19.

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Sanitation—(Continued).

Forced Circulation in Hot-Water Heating. Charles L. Hubbard. (101) Dec. 20.
Tanks. Arthur J. Martin, M. Inst. C. E. (Paper read before the Assoc. of Managers of Sewage Disposal Works.) (104) Dec. 20.
New Sewage Pumping Station in Detroit.* (14) Dec. 21.
Heating and Ventilation of Mount Vernon High School.* Ira N. Evans. (64) Dec. 24.
Methods Employed in Laying the Submerged Sewer Outlet Pipe in Lake Ontario, at Rochester, N. Y.* (86) Dec. 25.
Method of Laying a 24-in. Pipe Sewer in 30-ft. Cut in Quicksand in Freezing Weather at North Toronto, Ontario. George Phelps. (86) Dec. 25.
Imhoff Tanks and Sprinkling Filters for Sewage Treatment at the Fulton County Almshouse, Georgia.* P. H. Norcross. (13) Dec. 26.
Heating House with Wood Furnace.* (101) Dec. 27.
Report of Royal Commission on Sewage Disposal. (14) Dec. 28; (12) Dec. 6.
Sewage Pumping Machinery and Appliances.* J. Ralph Gibson. (62) Dec. 30.
Druckrohrleitungen der Stadt Paris.* Kutschke. (51) Serial beginning Sup. No. 22.
Gesundheitliche Schädigungen durch Zentralheizung. H. Chr. Nussbaum. (7) Nov. 16.
Die Abwässer der Fabriken als Strassenstaubbekampfungsmittel. (39) Nov. 20.
Ueber die Wärmeableitung von Fussboden.* F. Eichbauer. (7) Nov. 30.
Elektrotechnik und Moorkultur (Das Kraftwerk im Wiesmoor in Ostfriesland). J. Teichmüller. (41) Serial beginning Dec. 5.
Zur Vereinheitlichung der Regelungsvorrichtungen für Heizkörper.* (7) Dec. 7.

Structural.

Tenth Report to the Alloys Research Committee: on the Alloys of Aluminum and Zinc.* Walter Rosenhain and S. L. Archbutt. (75) Apr.
The Circular Diagram of Stress and Its Application to the Theory of Internal Friction.* O. H. Basquin. (4) Nov.
The Reinforced Concrete Column.* Carl Gayler. (Paper read before the Engineers' Club of St. Louis.) (1) Dec.
Uses Paving Bricks for Building Silos.* John Grayar. (76) Dec. 1.
The Hardwood Timbers of New South Wales, Australia.* W. H. Warren, M. Am. Soc. C. E. (29) Dec. 6.
Deep Steel Pile Foundations.* (14) Dec. 7.
Investigation of a Compound for Producing Dustless Concrete Floors. Albert C. Arend. (13) Dec. 12.
A Concrete Mixer of a New Type.* (13) Dec. 12.
Notes on the Operation of the Cement Gun.* Otto J. Swensson. (13) Dec. 12.
The Distribution of Stress at the Minimum Section of a Cement Briquette.* E. G. Coker. (Paper read before the Inter. Assoc. for Testing Materials.) (13) Dec. 13.
Tests of Waterproofing for Concrete. Cloyd M. Chapman. (Paper read before the National Assoc. of Cement Users.) (62) Dec. 16; (14) Dec. 21.
Discussion on Metal Lath Construction. H. B. McMaster. (Abstract of paper read before the National Assoc. of Cement Users.) (62) Dec. 16.
Notes on the Enlargement of a Gasholder. W. H. Vanner. (Paper read before the London and Southern District Junior Gas Assoc.) (66) Dec. 17.
Allowed Strains in Gasholder Designs. V. L. Elbert. (Paper read before the Am. Gas Inst.) (66) Dec. 17.
Electrolysis of Concrete.* E. B. Rosa, Burton McCollum and O. S. Peters. (Abstract of paper read before the National Assoc. of Cement Users.) (13) Dec. 19; (14) Dec. 21.
A Magnetic-Load Machine for Alternating Stress Tension Tests, and Some Results.* (13) Dec. 19.
Underpinning the Cross Building, Fifth Avenue, New York.* (13) Dec. 19.
Theory of Taper Columns.* W. M. Wallace, A. M. Inst. C. E. (From *Journal* of the Assoc. of Teachers in Technical Institutions.) (13) Dec. 20.
Fireproof Roof Failure, Chicago.* (14) Dec. 21; (13) Dec. 19.
Construction of Concrete Grain Elevators. R. P. Durham. (Abstract of paper read before the National Assoc. of Cement Users.) (14) Dec. 21.
Failure of a Reinforced-Concrete Theater in Course of Construction, Cincinnati, Ohio.* Clifford M. Stegner. (13) Dec. 26.
Failure of Stairway to Elevated Railway Station, Brooklyn, N. Y.* (13) Dec. 26.
Adjustable Steel Column Molds.* (14) Dec. 28.
Cement Sieve Specifications, Work of the Bureau of Standards.* R. Y. Ferner. (14) Dec. 28.
Large Concrete Foundation Slab. (14) Dec. 28.
Collapse of Moving Picture Theater in Cincinnati. C. E. Rasinsky. (14) Dec. 28.
Coefficient of Sliding Friction of Concrete on Concrete.* Frank P. McKibben. (14) Dec. 28.
Stress Measurements in a Cantilever, Hat-Slab Reinforced Concrete Floor, Determining Points of Inflection by Direct Stress Readings.* Arthur R. Lord. (Abstract of paper read before the National Assoc. of Cement Users.) (14) Dec. 28.

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Constructions Diverses en Béton de Ciment Armé, Système Monnoyer.* (35) Sept.

Rapport sur les Essais de Choc et les Travaux de la Commission 26.* G. Charpy. (Report to Inter. Assoc. for Testing Materials.) (93) Dec.

L'Essai de Dureté et la Résistance à l'Usure Mécanique. E. H. Saniter. (Paper read before the Inter. Assoc. for Testing Materials.) (93) Dec.

Structure de la Fonte et Effets de la Vapeur Surchauffée.* William Campbell et John Glassford. (Paper read before the Inter. Assoc. for Testing Materials.) (93) Dec.

Action des Electrolytes sur les Mótaux Soumis à des Efforts.* H. Baucke. (Paper read before the Inter. Assoc. for Testing Materials.) (93) Dec.

Sur la Façon dont se Comporte le Cuivre aux Essais au Choc sur Barreaux Entaillés. H. Baucke. (Paper read before the Inter. Assoc. for Testing Materials.) (93) Dec.

Enregistrement Automatique de la Rélation entre les Efforts et la Déformation des Matériaux lors du Choc.* André Gagarine. (Paper read before the Inter. Assoc. for Testing Materials.) (93) Dec.

Etude sur la Théorie d'un Appareil de Choc par Traction et l'Erreur qu' on Admet en Appliquant cet Appareil.* Nicolas Davidenkof. (Paper read before the Inter. Assoc. for Testing Materials.) (93) Dec.

Résilience, Mémoire sur un Appareil pour Essais au Choc des Eprouvettes Entaillées avec Dispositif pour Mésurer la Force Vive Résiduelle du Mouton après Rupture de l'Eprouvette, et sur les Variations de la Résilience des Métaux, mise en Evidence au Moyen de cet Appareil.* (Paper read before the Inter. Assoc. for Testing Materials.) (93) Dec.

Anlage von Scheunen in verschiedener Bauweise.* L. Kropf. (51) Sup. No. 23.

Der Zykloidenbogenträger.* Adolf Francke. (81) Pt. 6.

Zur Ermittelung von Kleinstwerten für Geländer.* Schack. (81) Pt. 6.

Ueber Trägheitsmomente von Dreiecken und von dreiseitigen Pyramiden. Ramisch. (81) Serial beginning Pt. 6.

Ergänzung zur Berechnung doppelt und einfach bewehrter Plattenbalken. L. Landmann. (78) Dec. 14.

Das neue Stadttheater in Duisburg.* Viktor Mautner. (78) Serial beginning Dec. 14.

Die Eisenbetonkonstruktionen an der St. Marienkirche in Offenbach am Main.* Jean Wörrlein. (78) Dec. 14.

Versuche über die Spannungsverteilung in gelochten Zugstäben.* E. Preuss. (48) Nov. 2.

Die Dachkonstruktion über dem neuen Gasbehälter in Berlin-Tegel.* A. Mecklenbeck. (48) Serial beginning Nov. 9.

Ueber die Wirkung des Auftriebes unter Pfeilern.* H. Zimmermann. (40) Nov. 16.

Die Rostgefahr bei Eisen- und Eisenbetonhochbauten. Quedefeld. (40) Nov. 23.

Unfallstatistik des deutchen Ausschusses für Eisenbeton.* (78) Nov. 27.

Auswertung der Ergebnisse von Versuchen mit Beton und Eisenbetonsäulen.* Joseph Ant. Spitzer. (78) Serial beginning Nov. 27.

Der Neubau der Sulfit-Zellstoff-Fabrik zu Maltsch a. O.* Wilhelm Iwand. (78) Nov. 27.

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Surveys of Property in Pennsylvania. Louis P. Blum. (53) Oct.

The Contour Survey of Bushey, Herts.* A. J. Laing. (104) Dec. 6.

Planetable Surveying.* (16) Dec. 14.

City Surveying in Brooklyn.* John B. Stein. (Paper read before the Brooklyn Engrs.' Club.) (13) Dec. 19.

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Water Filtration in Minneapolis.* A. W. Elison Fawkes. (60) Dec.

Drain Tile Investigations in Iowa.* A. O. Anderson. (76) Dec. 1.

The Equitable Adjustment of Rates for all Classes of Water Service in Freeport, Ill. Marston, Turneaure and Alvord. (Report made to the City and Water Co.) (86) Dec. 4.

Notes on Developments in the Purification of Water from the Hygienic Point of View. Allen Hazen. (Paper read before the Inter. Cong. of Hygiene and Demography.) (86) Dec. 4.

The Appraisal of Water Power Rights. Halbert P. Gillette. (86) Dec. 4.

The Hydro-Electric Plant of the Sherbrooke Railway and Power Company at Sherbrooke, P. Q.* (96) Dec. 5.

Foundation Failure of a High Concrete Dam, Port Angeles, Wash. (13) Dec. 5.

The Benefits of Water-Power Development and its Relation to Navigation Improvement. James E. Hewes. (Paper read before the Am. Elec. Ry. Assoc.) (27) Dec. 7.

Construction Methods on the Medina Valley Irrigation Project, Texas.* C. H. Keaney. (14) Dec. 7.

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Flashboard Design and Experiences, McCall Ferry Dam, Designed to Increase Capacity of Hydroelectric Plant Eight Per Cent.* (14) Dec. 7.
A Unique Utah Water-Power.* (27) Dec. 7.
Operating Results at Cincinnati Water Purification Works. (14) Dec. 7.
The Design and Construction of a River Intake Pipe Line at Fort Myer, Va., with Special Reference to the Inverted Strainer Used.* Leonard S. Doten. (86) Dec. 11.
Methods Employed in Increasing the Height of an Earth Dam with Reservoir in Service at Greenwich, Conn. Sheldon E. Minor. (Paper read before the Connecticut Soc. of C. E.) (86) Dec. 11.
Unit Costs of Filtering Water in Four Slow Sand Plants at Philadelphia. (From Annual Report of the Philadelphia Bureau of Water for 1911.) (86) Dec. 11; (96) Dec. 19.
The Problem of Interstate Swamp Drainage: The St. Francis Basin.* M. O. Leighton, M. Am. Soc. C. E. (86) Dec. 11.
Toronto's Water Filtration Project.* (96) Dec. 12.
What Hypochlorite Accomplishes. C. A. Jennings. (Abstract of paper read before the Inter. Cong. of Applied Chem.) (13) Dec. 12.
Large Humphrey Pumps for Chingford and Egypt.* (13) Dec. 13.
Riverdale Hydroelectric Plant, Automatically Controlled Relief Valves and Water Saving Devices at the End of Long Penstocks Replace the Usual Surge Tank and Standpipe.* (14) Dec. 14.
New Norwegian Hydroelectric Project.* (27) Dec. 14.
Pleads for Drain Tile Standardization. (Report of Committee, Ohio Tile and Clayworkers' Assoc.) (76) Dec. 15.
The Development of a Ground Water Supply at La Crosse, Wisconsin.* (86) Dec. 18.
Water Supply for London, Large Humphrey Pumps.* (96) Dec. 19.
Construction of Concrete-Lined Water Tunnel. Lee M. Hyde. (Paper read before the League of California Municipalities.) (96) Dec. 19.
A Theoretical Formula for the Flow of Liquids through Narrow Rectangular Channels. Ernst Jonson. (13) Dec. 19.
The Reversed Dam; a Hollow Concrete Dam of a New Type.* Frank C. Osborn. (13) Dec. 19.
Leicester Water Supply from the Derwent Valley.* (12) Dec. 20.
Advances in the Science of Water Purification. Adolph Kemna. (Paper read before the Institution of Water Engrs.) (104) Serial beginning Dec. 20.
Some Recent Examples of the Pollution of Public Water Supplies. John C. Thresh. (Paper read before the Institution of Water Engrs.) (104) Dec. 20.
New Diesel-Driven Pumping Installation at Rugby Waterworks.* R. A. Pfleiderer. (Abstract of paper read before the Rugby Eng. Soc.) (47) Dec. 20.
Egyptian Irrigation and the Assouan Dam.* (13) Dec. 20.
Concrete Lining of the Main Canal on the Boise Irrigation Project.* F. W. Hanna. (14) Dec. 21.
Handling Building Materials Across Main Track at an Ohio River Dam.* (18) Dec. 21.
The Design and Construction of a 600 000-Gal. Reinforced Concrete Elevated Water Tank at Berlin, Ontario.* (86) Dec. 25.
General Method of Constructing a Rock Fill Dam 125 Ft. High.* (86) Dec. 25.
Designs for Irrigation Structures.* (86) Serial beginning Dec. 25.
Use, Waste and Metering of Water in Chicago.* (13) Dec. 26.
Prewitt Reservoir Project, Involving a Diversion Dam with a New Type of Movable Flashboard Supports and a 3½-Mile Protected Embankment.* (14) Dec. 28.
Irrigation Project on the Price River in Eastern Utah.* (14) Dec. 28.
Formula for Frictional Loss in a Check Valve.* Charles B. Buerger. (14) Dec. 28.
Nouvelle Contribution à l'Etude des Turbines Américaines et Centripèdes.* E. de Morsier. (37) Nov. 30.
Druckrohrleitungen der Stadt Paris.* Kutschke. (51) Sup. No. 23.
Wasserkraftanlage mit Holzstoff- und Papierfabrik Wolfsheck der Firma E. Holtzmann & Cie. in Weisenbachfabrik (Baden).* Fr. Oesterlen. (48) Serial beginning Nov. 2.
Die Talsperre bei Mauer am Bober.* (40) Nov. 16.
Gewinnung von Trink- und Nutzwasser in Bayern.* Hans Holler. (7) Serial beginning Nov. 23.
Bedeutung des Grundwasserstandes. Keller. (51) Serial beginning Nov. 27.
Der Wasserturm im Rangierbahnhof Nürnberg (Inhalt des Behälters 480 m³).* Hermann Goebel. (78) Dec. 14.

Waterways.

The Waterways of Pennsylvania. Farley Gannett. (98) Nov.
Cargo Docks at Panama Terminals.* (62) Nov. 11.
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The Panama Canal.* Percy F. Martin. (12) Serial beginning Nov. 29.
A Visit to the Panama Canal.* E. D. Edmonston. (42) Dec.

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Concrete Piles and Concrete Piling Equipment.* Maxwell M. Upson. (67) Dec.
Proposed Inner Harbor Plan for the City of Richmond on San Francisco Bay.* (86) Dec. 4.
Flood Protection Work on the Kansas River at Kansas City, Kans.* Edward H. Schultz. (86) Dec. 4.
Panama Canal Tolls. Emory R. Johnson. (Abstract from Report to the Government.) (15) Dec. 6.
The Panama Canal.* (11) Dec. 6.
Engineering Problems in Ohio and Mississippi River Improvements. John Millis. (Abstract from paper read before the Cleveland Eng. Soc.) (62) Dec. 9.
Connecting Lake Washington, Seattle, with Puget Sound.* William L. Kidston. (14) Dec. 7.
Construction Costs on the Panama Canal for the Third Quarter of 1912. (86) Dec. 11.
Levee Construction in the Colorado River Delta and the Rock Fill Dam Method of Closing Crevasses.* (86) Dec. 11.
The Inland Port of Manchester.* (13) Dec. 12.
Proposed Rhine-North Sea Ship Canal.* (12) Dec. 13.
Rebuilding Ice Piers in the Kanawha River.* Thomas E. Jeffries. (14) Dec. 14.
Method of Erecting the Lock Gates for the Panama Canal.* (86) Dec. 18.
Methods and Cost of Barge Construction of Creosoted Lumber at U. S. Boatyard, Fountain City, Wis.* C. W. Durham and A. E. Hageboeck. (86) Dec. 18.
Causes of Earth Slides at Culebra Cut, Panama, and Methods of Remedying the Trouble.* Donald F. McDonald. (From Annual Report, Isthmian Canal Comm.) (86) Dec. 18.
The Settlement and Transport of Sand in Water. J. S. Owens, A. M. Inst. C. E. (Paper read before the British Assoc.) (11) Dec. 20.
The Pier Problem at the Port of New York.* (46) Dec. 21.
Construction Plant for the Third Lock at Sault Ste. Marie, Michigan.* (14) Dec. 21.
Flood Data in Canadian River Basin, New Mexico, Conditions Where Maximum Flood Stage and Rainfall Are Not Coincident. W. B. Freeman and Glenn A. Gray. (13) Dec. 21.
Cost of Reinforced Concrete Barge Construction, Panama Canal. (86) Dec. 25.
Flood Protection at Kansas City.* Everett B. Murray. (13) Dec. 26.
Reclaiming a Large Tract by River Protection Work at Kansas City, Employing Several Types of Levee and Dike Construction, including Mattress Revetment Work.* N. M. Fitch. (14) Dec. 28.
Rapport sur les Voies Navigables de la Vallée du Rhône. Ch. Lavaud. (32) Oct.
Zur Frage einer deutschen Rheinmündung.* (51) Dec. 11.

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